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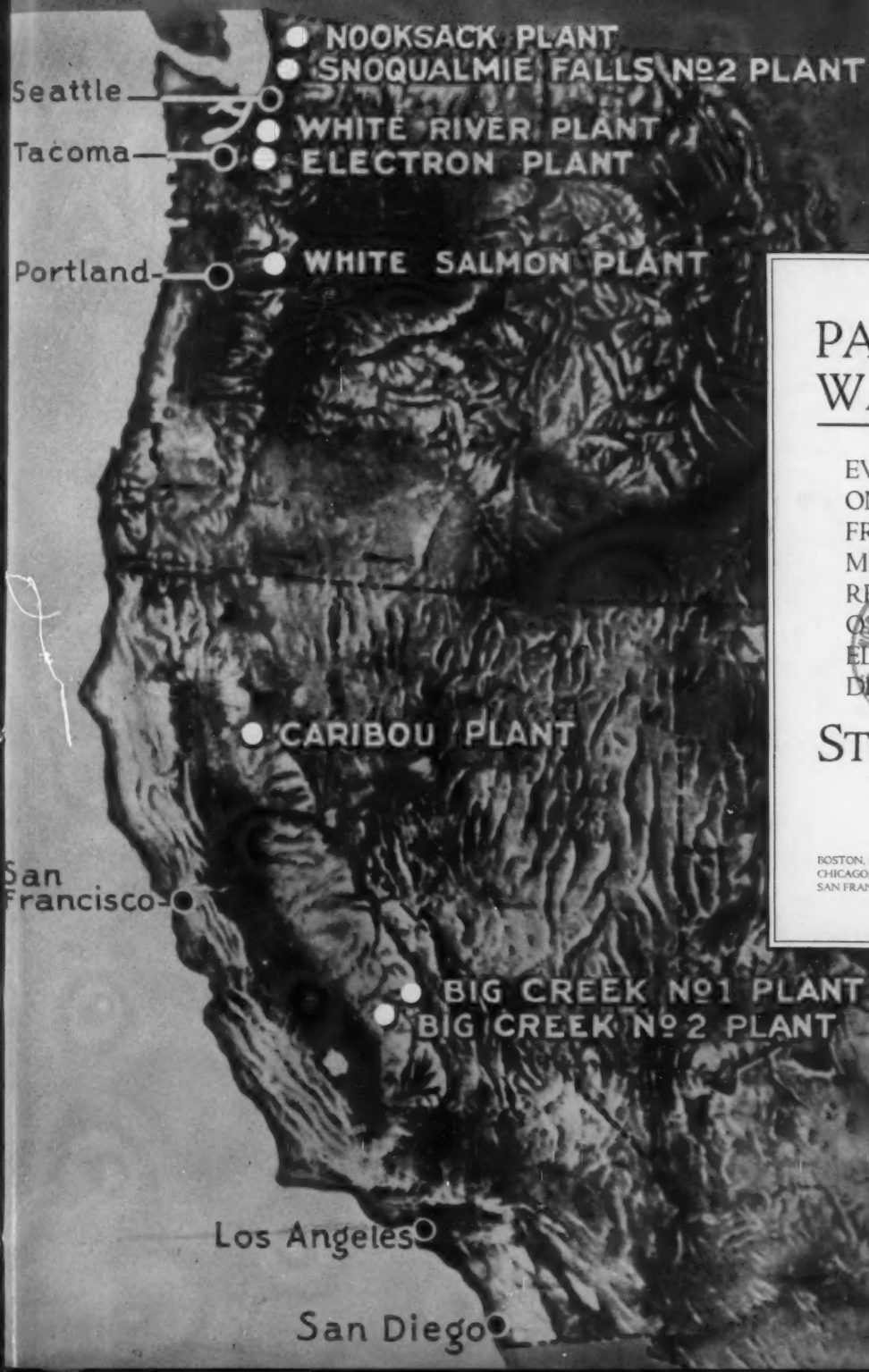

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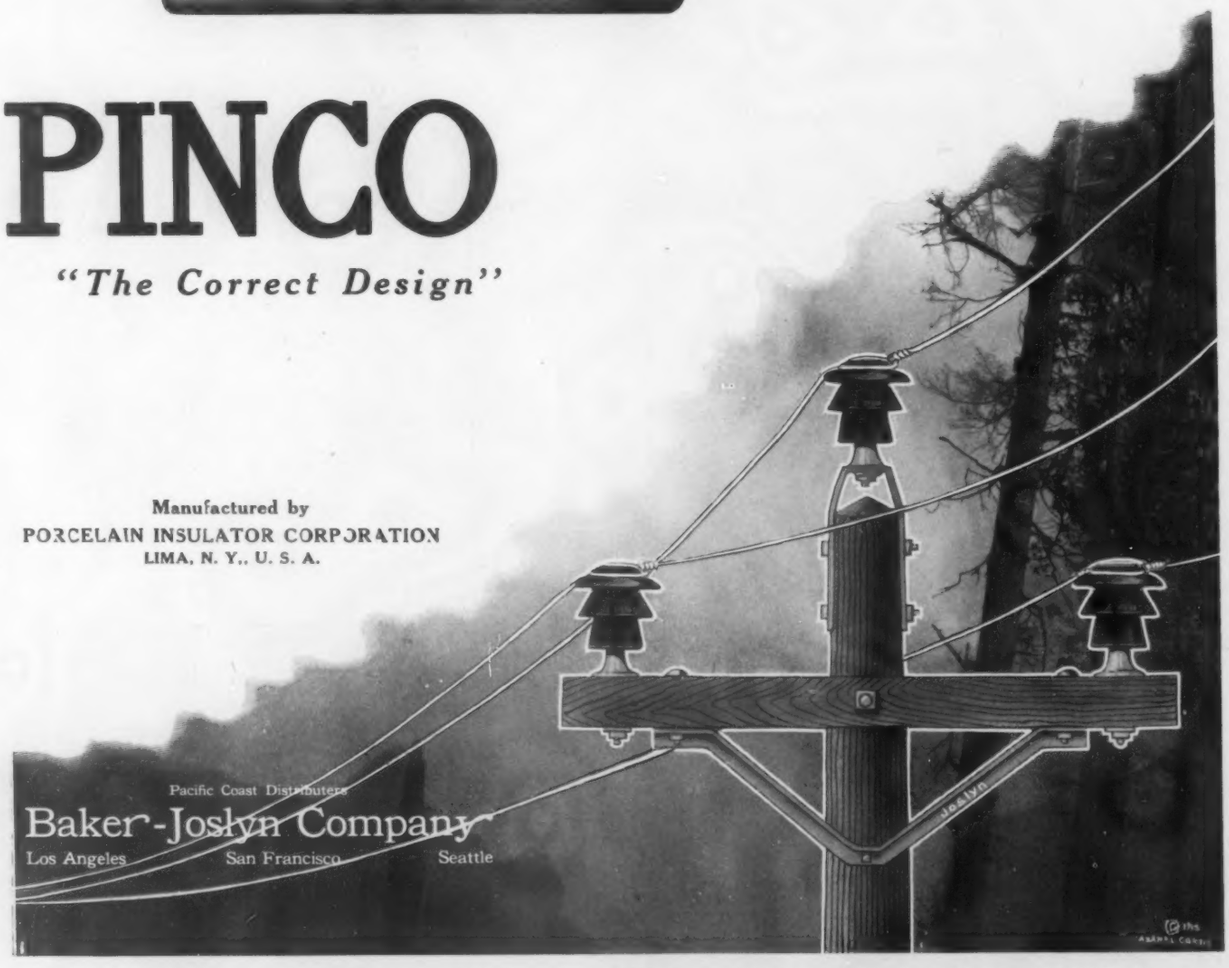

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Contents

EDITORIALS 39

A Fundamental Executive Failure — The Principles of Rate Fixing — The Cooperative Idea in Banking — American Construction Council to Unite Construction Industry — Need for More Attention to Electric Heating — Economic Conditions Change but Human Nature Remains the Same — The New Policies of President Smith of N. E. L. A. — The Impending Failure of the Western Fishing Industry — Some Problems in Marketing Western Mining Products.

DO YOU DEVOTE AS MUCH TIME TO YOUR MEN AS YOUR MACHINERY? — By J. David Houser 47

The Human Factor is the Weakest Link in the Chain of Production — A Suggestion of Practical Methods for Studying the Personnel Problems of Your Plant From the Standpoint of Improved Efficiency.

HOW ELECTRIC RATES ARE FIXED UNDER COMMISSION REGULATION — By Lester S. Ready 50

An Analysis of the Methods Employed by the California State Railroad Commission in Determining the Basis Upon Which Returns are to be Allowed and in Distributing the Burden Fairly Between Classes of Service.

WHY THE MANUFACTURER IS INTERESTED IN RETAIL SALES PROBLEMS — By E. A. Kincaid 54

The First of a Series of Articles Devoted to an Analysis of the Modern Tendencies in the Marketing of Products and the Advantages of Different Types of Distribution Methods Applied to Various Classes of Goods.

ARE WE GETTING AN ADEQUATE RETURN FOR OUR MUNICIPAL TAXES? — By William H. Nanry 56

It Will Pay the Business Man to Study the Following Analysis of the Costs of Government in the Major Western Cities, with a View to the Returns which Industry is Getting from the Taxes It Pays.

Western Comment on Current Events 42
Letters to the Editor 44
Rights of Down Stream Users on Interstate Rivers Sustained—by Paul Wooton 53
Marine Fuel Problems of the Pacific Coast—by D. Dorward, Jr. 58
Eliminating the Waste in Industry 59
Western Dealer, Jobber and Agent 61
Activities of the West 64
Meetings of Interest to Western Men 69
Personals 70
Manufacturer, Dealer and Jobber Activities 72
Business Outlook in Western Market Centers 73
Construction News and New Industrial Developments 74

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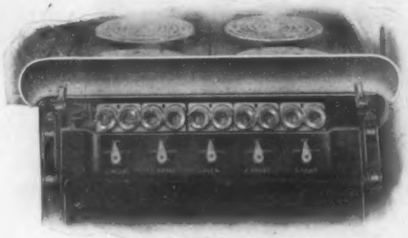

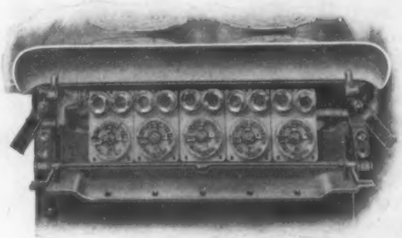

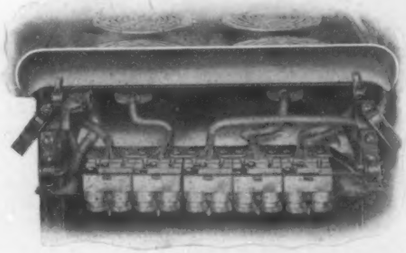

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ROBERT SIBLEY, EDITOR

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A Fundamental Executive Failure

HALF a dozen strikes of major importance and a dozen or more minor disturbances between labor and employers have marked the last six months. At the present time the coal strike and the railway shop strike are still unsettled, there is a longshoreman's strike in Portland which is dragging to its conclusion, a taxi driver's strike in San Francisco which has just about petered out and various reports of trouble from Colorado mines. These are but evidences of a condition of persistent labor unrest which is far more widespread. To any impartial onlooker it is evident that there is an unsettled problem somewhere in the relations between employer and employe — an important failure in the industrial system which is doing much to nullify the technical advances and efficiency methods to which so many years of study have been devoted.

Whose is the fault? If machinery is antiquated, or the sales department inadequate, we do not blame the defect against the engineer or the individual salesman, we charge the management with a lack of foresight and a false economy. And if labor conditions are unsatisfactory, if industry as a whole and the large majority of individual organizations present the picture of an armed camp with the employers on one side and the men on the other, separated by mutual suspicions, distrust and misunderstandings, we can only charge this condition to the fundamental failure of the management to solve the human side of their problem.

What constructive attempt has been made to improve conditions? There has been a lavish expenditure of time and thought and energy upon the physical aspects of industry. Chemists, physicists, engineers and accountants are busy studying out methods of saving wastes and improving efficiency in every mechanical branch, but there is practically no effort of a like nature being put forth toward the solution of human relationships. And yet it is the human beings who operate the machinery, direct the processes, handle the materials and administer the systems and where the mechanical factors are responsible for wastes of a fractional per cent, the loss which comes through friction and lack of interest on the part of the human beings involved can mount up into figures which cut in half the output of the plant.

Boards of administration are not a solution — although their importance should be recognized — no attempt to settle difficulties after they have arisen will bring about anything but a temporary peace. The answer, as to the problem, lies with the individual plant. The solution can be found — it is encouraging to report that there are many (if still a minority) of western plants which are attacking the situation intelligently. The greatest need of western industry at the present moment is the extension of this movement. There is a great reservoir of energy waiting to be tapped in the "willing" work of indifferent or dissatisfied employes. If the western executive will recognize his responsibility to study out the methods of unloosing this force, he will not only have taken the greatest possible step forward toward improving the business of his individual plant, he will have solved a social problem.

The Principles of Rate Fixing

THEORETICALLY prices are fixed by charging for the original cost of the article, plus the expense of handling it, plus a profit, which really is the interest return allowed on the capital invested. In practice the question of how much the market will stand, how much the man next door charges and how much surplus stock is on the merchant's shelves all have their part. All this is not very mysterious and is reasonably understood by the purchasing public. But call it a rate instead of a selling price and give it the authority of the railroad commission, and somehow the system acquires an air of mystery and is looked upon as an arbitrary method of robbery and extortion. The lucid article by an engineer of the California Railroad Commission which appears on another page of this issue should do much to straigten out misunderstandings.

Rates for electric power are fixed upon much the same basis as any other commodity. An endeavor is made to ascertain the manufacturing cost and the expense involved in delivering the product to the consumer's door. The amount of power purchased, the ability and willingness of the customer to pay, the surplus which the company has to dispose of, all have their part and are rightly taken into consideration in fixing the rate. The function of the Railroad Commission is to see that service is adequately and economically rendered, that the investment upon which returns are allowed is kept down to a minimum, that the rates fixed give approximately the

market return to stockholders over and above the expenses of operation. The entire process is based upon well established principles of rate regulation and is the result of a thorough investigation on the part of the regulating commission.

It may be well to point out that it is this carefully safeguarded neutral system of rate fixing, which the proposed California Water and Power Act would wipe out, substituting in its place the supervision of a Board which is partisan in any dispute which may arise. If a customer is dissatisfied with rates under the present system, there is a court of appeal at hand in the Railroad Commission, which has no interest in enterprises furnishing power and is concerned only with justice. Under such a system as the proposed bill would inaugurate, injustices in rates could be referred only to the Board which fixed them in the first place and which now acts as judge but furthermore is a party in the transaction on the opposite side to the consumer.

The Cooperative Idea in Banking

DIVERSITY of crops and business enterprises has has been one of the strongest elements in western prosperity, keeping this section of the country out of the worst of the national financial depressions. This same element is now to be taken advantage of to further the marketing of western crops.

This is the idea back of the recently announced merger of fifty-two important banks in twenty-four cities of Southern California. In this consolidation it is announced that no banks have been bought out and there is no desire to establish an institution which is phenomenally large. It is hoped that through the amalgamation of interests a more complete financial service may be rendered in the marketing of the various seasonal crops of this district. Thus the money returned in the spring from the sale of the orange crop can be used for the fall marketing of the raisin crop, while the returns from this source in turn will be available for the early vegetable grower of Imperial Valley.

The cooperative marketing associations of California have done much to further agricultural prosperity in that state. This is the application of the cooperative idea to banking and offers a new possibility of western service.

American Construction Council to Unite Construction Industry

FOR the first time in the history of American industrial development, a great industry will attempt through an organization known as the American Construction Council to unite all of its elements, including architects, engineers, general contractors, representatives of construction labor, manufacturers, material dealers, representatives of government bureaus, and public utility departments in a commendable effort to raise the standard and efficiency of the construction industry and improve the service which that industry renders to the public.

The cost of construction in every form is an overhead that enters again and again into every department of industry. The standards and policies that are to be adopted by the construction industry are therefore a matter of the greatest importance to all manufacturers and of especial interest to their associations.

One of the first and most important of questions which the new organization must face is whether or not the combinations, agreements and practices which have demoralized the building industry, obstructed its growth, multiplied the cost of construction through vicious collusive agreements with respect to labor and material, are to be continued. The same forces have likewise restricted production and apprenticeship and possessed and exercised arbitrary powers to interrupt work to cause enormous waste through jurisdictional disputes and sympathetic strikes.

All industry is therefore interested, not only in learning whether these root evils are to be recognized and met or whether the industry is to further tolerate the maintenance of material and labor monopolies which must inevitably continue to cause demoralization and corruption in the industry unless rational precautions are clearly and firmly taken to prevent their continuance.

The project is an ambitious one and the attempt to secure the cooperation of all the elements of this industry is of significant importance and is intimately connected to our whole industrial system.

Need for More Attention to Electric Heating

ELECTRICITY is not generally accepted as a satisfactory medium for heating buildings. Yet it has been definitely proven that with due care in designing, proper installation and intelligent operation, electric heating on rates available in sections of the West, where fuel costs are high and temperatures not excessive is not only practicable, but compares favorably with fuel costs and shows favorable load characteristics, to say nothing of its obvious advantages over fuel methods.

Electric heating is an exact science and correct heater capacities may be determined more accurately than fuel consuming heater or furnace capacities. The practicability of heating with electricity depends upon the rate for electric service and the relative cost of coal or other fuel, rather than climate conditions or types of buildings to be heated. Obviously an electric heating rate that would compare favorably with $18.00 coal might be prohibitive where coal costs only $6.00 per ton.

There are many sections of the West where it is unnecessary to maintain for prolonged periods a temperature of 30 to 40 degrees Fahrenheit in buildings over the temperature without. Where fuel costs are high and rates are favorable electric heaters of the radiation or convection types are economical and practicable. However, there is need for accurate knowledge on the part of those designing and installing such systems. Estimates and applica-

tions must be based upon sound engineering principles, keeping in mind that a kilowatt hour is equal to 3413 B. t. u. and no more. There is no excuse for guesswork or claims that some watts are "fatter" than others. To be satisfactory, electric heating systems must have at least the same and preferably more heating capacity than other fuel consuming devices.

Economic Conditions Change but Human Nature Remains the Same

A GENERATION ago the working men of this country were obliged to labor from sixty to seventy hours each week in order to earn a sum sufficient to secure for themselves and their dependents a bare existence.

In those days, it was usually necessary for more than one member of a family to obtain employment in order to prevent actual privation.

Today it is possible for the average workman to earn enough each week in from forty-four to fifty hours of labor to permit him to live in a state vastly superior to that of his predecessor. Only in exceptional instances are the wives and children of workmen now compelled to contribute to the family income, although the practice is still followed to a limited extent by the more thrifty.

This change in the economic status of our population has resulted solely from the successful application of superior brain power to the problems of industry. The enormous advances which have been made in the invention and introduction of labor-saving devices, together with the remarkable progress which scientific methods as applied to the management of business have produced, have made it possible greatly to increase the production of most commodities and at the same time to decrease the demand upon human effort.

It is a sad commentary upon the intelligence of our citizens that the contribution made to society by those directly responsible for these benefits is, in general, unappreciated and to acertain degree the well-merited success of many members of this group is an object of envy and frequently of resentment by large elements of their fellowmen.

The New Policies of President Smith of N. E. L. A.

ONE of the best ways of securing cooperation in a great national organization such as the National Electric Light Association is for the chief executive to get out into the field and meet the leaders in the various sections of the nation. Particularly is this necessary in those districts remote from national association headquarters, where but few ever have the privilege of intimate contact with national effort.

It is with no little satisfaction that leaders in the electrical industry throughout the West have witnessed during the past month the president-elect, Frank W. Smith of New York City, attending the sessions of the Pacific Coast Electrical Association in Los Angeles and the Northwest Electric Light and Power Association at Boise, Idaho. Not only was he in attendance, but the zest and vim with which he entered into discussions and committee meetings where the national slant seemed desirable has won for him a support throughout the West that means one hundred per cent loyalty for the National Association during the months immediately ahead.

The Impending Failure of the Western Fishing Industry

THE outstanding problem of production faced by the cannery operators is the failing supply of fish. Each year the pack is growing smaller. Whether this is occasioned by too much fishing or some other cause has not been as yet determined. The fact remains, however, that here is a great problem in the conservation of our natural resources that should receive research study along broad and basic lines. Not only is the conservation of our salmon, halibut and herring fisheries a matter of outstanding importance, but our animal life such as elk, antelope, mountain sheep, whales and other marine mammals should receive attention. Nearly all of these will sooner or later be classed among the vanishing animals unless effective steps be taken soon for their adequate protection. It is an inspiring sight in the spring to witness the great Alaskan fishing fleet sail out through the Golden Gate to the North for their season's work, but when we contemplate the possibility of these wonderful resources, particularly of the sea, shortly being exhausted it is well that we turn our attention seriously to this problem. Public interest should no longer be delayed in looking toward the protection of the flourishing fish canning industry of the Pacific.

Some Problems in Marketing Western Mining Products

THERE are three outstanding problems that face western industry connected with the marketing of western mining products. The first is the absence of public bids in arriving at metal quotations. The second is the inability of metal producers to regulate in any manner the price of their products, and the third is the matter of transportation rates. As to the first problem, a thorough organization of metal producers and the formation of an exchange seems to be the only sane method of arriving at a solution. Regarding the second question, since metals produced in the West sell largely on a world market, some form of corporation or association to operate internationally offers the best solution. The third problem, on the other hand, is undoubtedly the one of greatest importance. A revision of the freight rates so as to effect very material reductions on low grade ores in concentrate seems a pressing necessity. This matter is now pending before the Interstate Commerce Commission and industry generally in the West will watch its outcome with the greatest interest.

Western Comment on Current Events

Editorial Notes and Readers' Views on the Outstanding Aspects of Financing, Trade Promotion, Legislative and Associated Topics that have a Special Bearing on Western Business

A Basic Steel Industry Planned for the West

An event of great importance to the West was reported recently in the announcement that the Columbia Steel Company has obtained control of the coal and iron properties of the Utah Coke and Coal Company. This means the early development of a primary iron and steel industry for the West, the lack of which has always been a retarding influence in western growth, and the exploitation of the vast resources in iron ore with which this region is so plentifully supplied. An idea of the importance of this project to western industry may be judged from the figures of $725,000,000, brought out by the recent industrial survey of the Journal of Electricity and Western Industry as the probable expenditure during the next ten years for structural steel alone in the eleven western states.

The plan as announced calls for the formation of a new corporation with a capitalization of $15,000,000 to take over the rolling mills and steel foundries of the Columbia Steel Company and the assets of the Utah Company. It is expected that this development will probably be the basis for other combinations of steel companies on this coast.

Among the business men associated in the project are Wigginton E. Creed, president of the Columbia Steel Company and the Pacific Gas and Electric Company, J. D. Grant, A. E. Boynton, Joseph Sloss, W. P. Hammon, John S. Drum, Herbert Fleishhacker, Mortimer Fleishhacker and Alfred Esberg, all of San Francisco and W. W. Armstrong, L. F. Rains, A. C. Ellis, Jr., A. M. Clark and D. H. Botchford of Utah.

The following statement from Mr. Creed outlines the scope of the project:

> An intensive investigation extending over a period of more than eight months has demonstrated that the Utah coal and iron properties can be used to form the basis of an independent steel industry for the Coast and Mountain territory. The West needs the basic industries of coal and iron fully developed and an unusual opportunity exists for progress in this direction by cooperation between California and Utah in the utilization of their natural resources.
>
> Steel mills on this coast have been dependent on China and on points in Pennsylvania, Illinois and Alabama for their supply of scrap and pig iron, and this raw material will now come from the Utah Coal and Coke Company properties, in Carbon and Iron counties in the southeastern part of Utah.

The Columbia Steel Company, control of which is to pass to the new corporation to be formed to manage both this property and the Utah fields, owns and operates a steel foundry at Portland and steel rolling mills and a steel foundry at Pittsburg, California.

The Increasing Menace of Tax Free Institutions

The taking over by the city of Los Angeles of the distributing system of the Southern California Edison Company is a transaction which furnishes considerable food for thought as to what the outcome will be if tax free institutions continue to grow in this country. The city paid nearly twelve and one-half million dollars for an investment which yielded about four million dollars in revenue to the Southern California Edison Company in 1921, and upon which this company paid approximately seven hundred and fifty thousand dollars in state taxes.

In the future the city of Los Angeles will probably supply energy to its consumers at about one cent less per kilowatt-hour, because the city does not have to pay taxes. The public will attribute the lessened rates to some inherent superiority of municipal ownership as compared to private operation.

Taxes in California are largely raised from the gross incomes of her privately owned public utilities. This amounts to about seven million dollars from the electric utilities alone. When one city operates its utilities free of this state charge the citizens of other communities "dig up" the difference.

Rest assured that some one is going to pay the taxes, and no matter how painless or indirect the method of extraction, the man of modest income, who depends upon salary or wages and not from tax-exempt bonds, is usually the man who feels the burden most.

Final Conference of the Colorado River Commission

According to a telegram made public by the Governor of New Mexico, the final conference of the Colorado River Commission will take place in Santa Fe, New Mexico, on or about August 1st. Governor Mechem is advised that Secretary of Commerce Herbert Hoover will be in attendance at this final sitting to consider the apportioning of the waters of the Colorado River. Following the determination of this apportionment will probably come the opportunity on the part of various agencies to secure part of the ultimate benefits which can be anticipated as a result of any comprehensive plan of protection, conservation, and use of this river. Many attempts have been made to interpret the public utterances of Secretary Hoover and other officials as committing themselves to some definite plan.

It is generally conceded that as the Colorado development is an international and inter-state problem, certain projects fall naturally within the scope

of Congressional action. As long as the principle of economy continues to be agitated in the public press, the Colorado development plans would probably be listened to by senators and representatives in Washington who would talk voluminously on the subject. However, certain projects which are neither international, inter-state nor in conflict with the fundamental plans of the whole should not wait upon Congress. Such would seem to be the case in at least one instance, wholly within the state of Arizona where mining and agricultural interests stand ready to proceed with the immediate development of a project which will hasten the economic growth of this state and its industries.

A reasonable amount of good will be done in river-control by every non-storage project; certainly no possible added danger from flood run-offs can result from such developments. As Arizona grows, so the adjoining states and the country at large will profit by the ability of its industries to further develop the resources of the state. Within the last year California business firms alone sold millions in machinery and supplies to the industries of Arizona. A clearer vision of the future and intelligent self interest must be shared by all who manifest interest in the Colorado River Basin.

Interesting Road Statistics

Information on the kinds of road constructed, cost of various types of roadways and other items incident to the development in road construction during recent years are given by the Bureau of Public Roads, United States Department of Agriculture, for the group of states, including California, Oregon and Washington and compared with similar figures for the whole country. The figures are based on completed Federal-aid roads during the period 1916-1921.

In this group of states 109 projects have been completed totaling 702 miles at a cost of 13 million dollars, of which half was federal aid. Of this total 92 per cent was paid for grading, 54 per cent for surfacing, 9 per cent for structures and 5 per cent for engineering, as compared to an average for the whole United States based on 7,480 miles at a total cost of more than 112 million dollars, of 21 per cent for grading, 61 per cent for surfacing, 1 per cent for shoulders, 12 per cent for structures and 3 per cent for engineering.

This group of states spent 10.5 per cent of the total amount expended in the country for surfacing Federal-aid roads and the area surfaced amounted to 8.9 per cent of the total.

The proportions of the total area surfaced with different types of material were as follows: Gravel, 57.6 per cent; plain and surface treated macadam, 1.8 per cent; bituminous concrete, 9.6 per cent, and plain cement concrete, 26.7 per cent; reinforced concrete, 4.3 per cent. The cost of these pavements per square yard was for gravel, 60 cents; plain and surface treated macadam, $1.01; bituminous concrete, $2, and cement concrete, $2.35; reinforced, $1.93, as compared with an average cost for the whole country as follows: Gravel, 46 cents; plain and surface treated macadam, 95 cents; bituminous macadam, $2.10; bituminous concrete, $2.50, and plain cement concrete, $2.57; reinforced concrete, $2.74.

In interpreting these figures and in comparing those for the group with the whole United States, officials of the bureau say it should be understood that there was considerable variation in the conditions under which the roads were constructed, such as thickness of pavement, accessibility of materials, specifications and labor costs.

Government to Reforest Burned Lands

A five-year program of reforestation in the government forest reserves of the Coeur d'Alene district, especially in the Deep creek and Jordan creek territory, commencing 35 miles east of Spokane, has been announced by forest service officials in the Coeur d'Alene district. In 1910 thousands of acres at the head of the north fork of the Coeur d'Alene river were burned over. Natural reproduction of timber trees followed this burn and would have resulted in a fine stand of timber in 100 years if the area had not been burned over again in 1919.

The 1919 fire was extremely hot, since there were millions of feet of dead timber, both standing and down, left by the preceding fire. The later fire wiped out the new forest growth leaving nothing but bare ash-covered hills, blackened snags and down logs. No seed trees remained living to re-stock the area so if left to follow the natural courses, it would require possibly a tree generation of 120 years for a complete restocking of the forest cover.

A survey of this area was made in the fall of 1921 and it was determined that 14,000 acres on Deep creek (the east fork of the North Fork of the Coeur d'Alene river), and Jordan creek needed to be planted. This project will be started this fall on a five-year plan necessitating the planting of about 3,000 acres a year. This work will have to be done during the fall of each year during the program,—since the snow lies so deep on the divides in the spring that transportation of supplies is impracticable until it is too late for planting on account of dryness.

The stock to be planted is made up of yellow and white pine grown at the forest service nursery, Haugan, Mont. The stock will be largely 2-year-old seedlings, which will be planted approximately 800 to the acre so that a total of nearly 2,400,000 will be set out each year.

The degree of success in planting depends greatly upon the weather immediately following the work. The survival of seedlings is in the neighborhood of 50 per cent in dry years, while it rises to 80 and even 95 per cent in moist seasons. The present cost of this work, exclusive of the cost of stock, is from $5 to $7 an acre, of which two-thirds is labor.

Letters to the Editor

Industrial Heating a Growing Field For the Application of Electrical Equipment

To the Editor:

Sir: The entire electrical industry is anxiously watching with growing interest the rapid development of the application of electric heat to industrial processes. But a few years ago the term "industrial electric heating apparatus" was confined to such equipment as glue pots, solder pots, small muffle furnaces, soldering irons, etc., and as such was of interest only to the manufacturers of such equipment because of the comparatively limited field of application and the fact that its use was but a matter of convenience.

Its importance to the entire electrical industry now is revealed by the fact that surveys conducted by several large central stations operating in the denser industrial districts have revealed the fact that the potential electrical industrial heating load in their districts is from two to four times their existing lighting and motor load. And in all other districts the field of application is broadening to an extent exceeding even the anticipation of those directly concerned in its development.

It is an interesting observation to note that almost everywhere the cost of a heat unit developed electrically is greater than that developed by gas, coke, coal or oil but just as gas has replaced other forms of fuel, under similar circumstances, so now has electricity come into manufacturing process displacing other forms of fuel for heating, not on the merits of its lower heat unit cost, but because it reduces to a minimum the total cost of a satisfactory product. Its cleanliness, its perfect and certain control of temperature, making possible a higher quality of product where accurate temperature control is essential, its efficiency of utilization and the increased production resulting from its use, are a few of the characteristics more conspicuously responsible for its acceptance. In the automobile industry its use is almost universal for baking enamel on fenders and other parts.

One manufacturer told the writer that the savings effected through the use of a large conveyor type electric enameling oven over former similar gas-fired equipment paid for the complete electrical installation within three months, not to mention the higher quality of the electrically baked ware obtained.

Another comparatively new field of development in which electrical heat has proven its merit, is in the baking of foodstuffs, and already there are a number of highly successful installations of this equipment. The writer was informed by the foreman of a large bakery whose production is about 20,000 loaves of bread per day that in the electrical equipment now used, the savings effected in scaling of bread over former gas-fired equipment, more than paid the power bill. And in the field of application requiring higher temperatures such as the melting of ferrous and non-ferrous metals, the heat treatment of steels, vitreous enameling, etc., outstanding successful installations are at hand, though the field has hardly been touched.

It would be presumptuous to boast that electricity will, within a reasonable time, displace all other forms of fuel for heat generation, but where accurate and positive temperature control is essential in obtaining a high quality product at a minimum over-all cost, its application both within the range of low and high temperature has unquestioned promise. And in industrial communities, the electrical industry should assess the industrial heating field at a value comparable to that given other forms of electrical power application.

F. F. McCAMMON,
Vice-Chairman of the Denver Electrical Cooperative League, and Power Sales Engineer, Denver Gas and Electric Light Co.
Denver, Colo.

Street and Highway Lighting Exhibit Shows City Possibilities in Adequate Illumination

To the Editor:

Sir: I notice in your May 15th issue of Journal of Electricity and Western Industry an article by Mr. Geo. T. Bigelow, entitled "Why City Streets and Highways Should Be Better Lighted."

It occurs to me that your readers may be interested in the N. E. L. A. Ornamental Street Lighting Exhibit on the Million Dollar Pier at Atlantic City. This exhibit, composed of a representative list of ornamental equipments from

LIGHTING EXHIBIT SHOWS MODERN ILLUMINATION TENDENCIES
The modern type of lighting equipment shows the ornamental possibilities of the present well built standard in contrast to the purely utilitarian and often unattractive earlier lighting systems. There is coming to be a general acknowledgement of the principle that the prosperity of a city or a business district is definitely tied up with the good lighting of its streets.

the various post and fixture manufacturers, gave a definite conception of the day and night appearance of the complete units as well as an idea of the trend of modern street lighting equipment design. The highly efficient equipment which is now available is in marked contrast to the old three and five ball globe cluster units for business district lighting and to the wooden pole—mast arm—dangling wire equipment which has been extensively used in the past for thoroughfares and residence streets. It will be noted that there is a trend toward the lantern type luminaire, and toward the use of rippled crystal glass; the bracket type standard for thoroughfares and residence streets is also rapidly gaining in favor. Most striking of all, perhaps, is the distinct tendency toward a higher mounting height in all branches of ornamental lighting.

The business district units were equipped with 15,000 lumen (1,500 c.p.) lamps, the thoroughfare units with 10,000 lumen (1,000 c.p.) lamps, and the residence street units with 4,000 lumen (400 c.p.) lamps.

J. R. COLVILLE,
Engineering Department, National Lamp Works.
Cleveland, Ohio.

With the Decreased Cost of Living, the Public Will Now Expect Lower Utility Rates

To the Editor:

Sir: There never was a time in the history of public utilities when the question of proper public relations was as important as it is at this time. As a general proposition Public Relations always should be foremost in the minds of public utility operators, and not in their minds alone but in the minds of the employe body as well; but conditions under which we find ourselves today make it particularly necessary that we devote much thought to the problem as it presents itself at this time.

While it is true in normal times that any act or any statement of any employe at any time may be far-reaching in its consequences, it is particularly true at this time when the public mind is set on the hair-trigger and an explosion is always imminent.

I mean to say that during the last two or three years many utilities have been enabled to improve their revenues through favorable commission orders with reference to rates, but in few if any cases have rate increases been more than sufficient to enable the utilities barely to struggle through and continue to operate. Now there is a general tendency toward lowering of commodity costs and labor costs throughout the country and there will be a gradual expectation, which, by the way, has already manifested itself in some quarters, that utility raees will likewise be reduced.

Unfortunately, the public soon forgets. The public will forget, if it has not already forgotten, that any rate increases granted to the utilities were only a small per cent of the increases in other commodity prices during the period of soaring costs. It will forget, if it hasn't already forgotten, that the utilities carried their burdens of high material and labor costs during the period of the war and thereafter until their surpluses and reserves were exhausted and receiverships not only threatened but in hundreds of cases became facts.

The public is in a frame of mind to **welcome** general reductions in utility rates right now, and unless the utilities exercise wisdom and ingenuity and diplomacy and bring into play all the admirable qualities which commend themselves to the public, there will be an inevitable **demand** for a lowering of the rates.

So I say it is a critical time in the history of public utility operation from a public relations standpoint, and it is important that we consider seriously and earnestly all the possibilities that present themselves to our minds for cultivating and developing and holding the good will of the public. And it must be something more than a passive sort of good will—it must be a good will which manifests itself in an active interest in our welfare, based upon the realization that a utility can function only to the degree that it is backed up by public sentiment, as one of the foundation stones, and upon a hearty appreciation of the effort of the utility to satisfactorily serve as demonstrated in the attitude and manner of those officials and employes who have personal contact with the public. These are two sides of the arch of ideal public relations and the keystone is the best possible service under any existing circumstances.

In the matter of bringing the public to a realization of its share in the responsibility for the service which the public requires, the Rocky Mountain Committee on Public Utility Information, for example, is doing a splendid work and is rendering a valuable service. The advertising copy which is being prepared by the executive manager and supplied to the several utilities is calculated to strengthen the position of the utilities in their respective communities. The material furnished to public speakers cannot but react favorably upon clubs and civic bodies when presented by men of standing. The use of the news bulletins will undoubtedly have a pacific influence upon their readers.

But all these are not enough. There must be tireless effort on the part of the operating management so to imbue every employe with the spirit of service and with a sense of individual responsibility for the company's welfare that he will see to it that no word or act of his while on duty or off duty, shall cause any other feeling than that of high regard for the company and appreciation of its efforts; that his every word and action shall be a studied effort to inspire trust and confidence and a sympathetic interest in his company's well being.

As a matter of fact, that is no more than the employe's duty; it is an implied part of his contract of employment. He contracted to **work for the company** and certainly, indifference, discourtesy, thoughtlessness, or crabbedness, are traits that work **against** the company. One of the last commands of the Master to His disciples was, "As ye go, preach." I heard a wonderful sermon on that text some time ago, and I must confess that I missed some of the spiritual applications of the text for I found myself applying it to the work of public utility employes. And if I were using that text for a talk to employes I think I would not interpret it as an injunction to stand up in public places and render long discourses, but I would point out the possibility and the duty of preaching by word, by act and by example at all times the gospel of mutuality of interest between the public and the public utility.

As ye go, preach! In the family circle, to social acquaintances, to business acquaintances, in season and out of season, they should let it be known that their company's one aim is to serve, but that the quality and extent of the service necessarily depends upon the active support of the public.

The extent to which it is possible to imbue the several members of an organization with a sense of individual responsibility for the success of an enterprise is illustrated by the story of a stoker on the battleship Oregon. You will remember that when hostilities broke out between our country and Spain the Oregon was off the Pacific Coast. Commander Clark made a record run around the Horn and arrived in time to participate in the battle of Santiago. While the guns up on deck were thundering destruction to the Spanish fleet, a big Irish stoker away down in the hold loaded up his shovel, slammed the coal into the furnace, and exclaimed, "There! take that, you damned Spanish dagoes!"

That is the spirit that we must get into our organizations. Each member must feel that no matter how humble his position, he has an individual responsibility which he must not shirk.

J. F. GREENAWALT, Publicity Manager,
Mountain States Telephone & Telegraph Co.
Cheyenne, Wyoming.

RADIO BULLETINS

The Journal of Electricity and Western Industry broadcasts a special industrial and business news report each Monday night at 7:30 o'clock, both from San Francisco and Portland. The San Francisco report is broadcasted from station KLP, operated by the Colin B. Kennedy Company at Los Altos, California. The Portland report is sent out by the Northwestern Radio Manufacturing Company from station 7XF. Both reports are broadcasted on a wave length of 360 meters.

Builders of the West

GIVING up the cherished ambition of one's youth, after carrying it along successfully for many years as a marginal occupation and yet using it through life as a sort of private secretary to the main business of one's career, is not uncommon perhaps in the complex professional life of the twentieth century, but few men who make such a sacrifice succeed with it so well as has Dr. W. J. Kerr, president of the Oregon Agricultural College, Corvallis, Oregon. It is as an educator that Dr. Kerr is chiefly known today, yet as a youth he had mapped out quite a different career for himself.

DR. W. J. KERR

who has just completed his fifteenth year as president of the Oregon State Agricultural College and who, alike through his personal interest in business and his administration of one of the great technical colleges of the West, is recognized as a dominant factor in the development of the Pacific Coast.

Throughout his school days he was interested in debating and quite early in his college career, he decided to become a lawyer, declining an opportunity to go to West Point because he believed that the true battlefield of the country's progress was in the court room. This ambition followed him for several years and through several different occupations—business, teaching and administration. He studied commercial law and made rather extensive readings in general law. But his growing interest and opportunities in educational work were such that he was never able to return to his original plan of entering the legal profession, though he did not abandon it entirely until he came to Oregon and took up his life work of developing the State Agricultural College. His studies in the law, however, have been a never-failing asset to him in preparing educational measures for the legislature and in prosecuting educational campaigns before the people.

Born at Richmond, Utah, and educated in the schools and state university of that state, he subsequently took a higher college degree from Cornell and then went into educational work, considering it a temporary pursuit. Instructor and professor in his state university and finally president of the Utah State Agricultural College, he built up the professional preparation that made him the successful candidate for the presidency of the Oregon State Agricultural College when that position became vacant in 1907. Already he had been president of the Association of American Agricultural Colleges and Experiment Stations and a member of the constitutional convention of Utah.

President Kerr's task in organizing and enlarging the work of the Oregon Agricultural College has in the brief space of fifteen years lifted this institution from comparative obscurity to a recognized position among the leading grant colleges of the country. As rapidly as the needs and resources of the state would permit, he raised the requirements for entrance and for graduation, until by 1915 they were fully standardized. The college buildings have been increased three times in number and more than that in value and capacity. Student enrollment has increased over five times. Courses of instruction have increased more than tenfold. The military department has been built up until it has regularly ranked the college since 1917 among the "distinguished institutions" of the country, with five units of the R. O. T. C. The extension service has been established with an organization covering the entire state and the Experiment Station has been expanded to seven branches.

Early in his educational career, Dr. Kerr formed a definite conception of the function and scope of the land grant college as an institution of scientific and technical training as compared with the state university, which might be classed as a "literary institution." His work in building up the Oregon college has done much to rid the agricultural school of the stigma alike of "trade school" and of "an impractical school of theory" and has placed it on an equal footing with the classical type of college.

President Kerr has the rare gift of broad vision coupled with skill in analyzing details, and to his command of financial problems as well as to his qualities of dynamic leadership may be credited his success as college president. To Dr. W. J. Kerr, as one who ranks among the most constructive college executives in America, a pioneer among educators in the Northwest in the idea of uniting learning and labor, applying science to industry, this issue of the Journal of Electricity and Western Industry is affectionately dedicated.

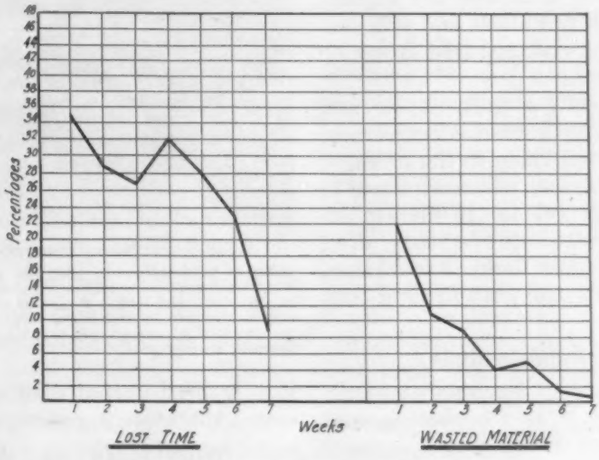
Do You Devote as Much Time to Your Men as Your Machinery?

The Human Factor Is the Weakest Link in the Chain of Production—A Suggestion of Practical Methods for Studying the Personnel Problems of Your Plant From the Standpoint of Improved Efficiency

By J. DAVID HOUSER
President, Bureau of Management Research

THE arraignment of the organization and administration of American industry found in the report on "Wastes in Industry" recently issued by Herbert Hoover's committee of engineers is as incisive as it is startling. The conclusions are based upon the careful, scientific, dispassionate investigations into industrial methods and results that would be expected from a highly trained group of engineers. Results in industry are shown to be so far below what they should and could be—actual effectiveness is conclusively proved to be such a small percentage of what is clearly possible—that it is almost disheartening. For it would seem to give color to the assertions that our widely heralded material achievements are the result of a wealth of natural resource and an easy environment rather than any large native ability to organize, plan, execute and administer.

One of the principal purposes of this report has obviously been to shock American industrial management into a realization of its comparative inefficiency. It would have been but natural to have presumed that engineering treatment of such a subject would have confined itself to materials, machines, methods and processes. But it is not true of this report. The prevailing emphasis throughout is upon mental and human values. The most forceful generalization to be found in the report deals with the necessity for new attitudes and broader viewpoints on the part of both management and men in industrial enterprises. And a very large percentage of the wastes which are the subject matter of the report are shown conclusively to be wastes of immediate human origin. Lack of proper adjustment of the human factors in industry, misunderstandings, inadequate training and conflicts of authority are typical illustrations.



RESULTS OF "REPORTING DOWNWARD"

Copy of graphic curves posted on a large board in a mill of the Emeryville plant of the Paraffine Cos., Inc., for the information of the crews. Work done by these crews was analyzed to show percentages of lost time and wasted material further on in the process but caused by imperfections in the work of the mill crews. The interest in competition with the general record and between crews brought about startling reductions in both lost time and wasted material in the seven weeks shown in the chart.

The Futility of Supposed Cure-Alls

No amount of preaching about the mutual interests of employer and employe or the identical interests of "capital" and "labor," no number of declarations about the desire of the employer to be fair (ninety-nine of every hundred employers want to be fair and think they are being fair), no number of arbitration boards or no amount of conference machinery, and no amount of publicity, either conciliatory or pugnacious, will ever bring about general and lasting industrial cooperation and harmony in an individual plant or in industry as a whole. Neither will bonuses, profit-sharing, stock ownership by employes, "industrial democracy," "welfare work" or any other one plan do so. There is no universal cure-all for industrial unrest or for inefficiency caused by the dissatisfaction and strained relationships found in the vast majority of American industrial and commercial organizations.

"Inefficiency" and "dissatisfaction" are, of course, relative terms. No industry is completely efficient nor could any humanly be made so. But some industries are more efficient than others, and it is absolutely safe to say that in ninety per cent of the cases the efficiency is in direct ratio to the attention given human problems.

Efficiency is a matter of getting things done — of carrying out most effectively the purposes for which a group of human beings are associated together with the necessary physical equipment. The latter is not insignificant, but transcending it enormously in importance is the effectiveness with which the human units of the group work together. In other words, the human organization is by far the most vital element to the success—the efficiency—of any enterprise, industrial or other.

What the Human Organization of Industry Deserves

"Personnel work" means the deliberate organization and study of human relationships, the devotion of specialized and careful attention to all of the human phases and problems of an enterprise. It means, briefly, the spending of time and thought upon (1) selection, so that the right man may be placed in the right work, (2) training—so that he may then do the work in the best way and be kept improving, and (3) morale or motivation—so that, having been placed upon work most fitted for him and trained to do it in the best way, he may want

to do his best and keep on wanting to do it. Each of these is a very comprehensive topic, of course, and has much significance and many ramifications.

If the importance of the human factors in industry are admitted, the necessity for such intensive attention must likewise be evident. For the splendid results of industrial cooperation will never be realized as long as human problems continue to receive only the careless and incidental attention that has characterized their treatment all through industrial history. It is such treatment that has made the story of industry one of almost continuous warfare and is the cause of its existence today as a pitifully inadequate social institution. Human beings are intricate organisms and human nature is complex beyond any other force that industry has ever tried to utilize. The matching of human ability to tasks for which it is inherently best fitted, the increasing of that ability for better performance of those tasks or for more complicated ones, the stimulation of enthusiasm and belief, the awakening and maintenance of the will-to-do are achievements that will challenge the highest type of ability that industry can enlist and will justify and richly reward all the concentrated attention that can possibly be afforded.

Psychology, the science of human behavior, and education, the art of increasing human effectiveness, have both been of fundamental value in the creation of a technique for real personnel administration in industry. This technique is yet in its merest infancy, but its extensions and improvements even during the last few years have been remarkable. Nothing can apparently stop its growth and constantly wider application.

A Fundamental of Fundamentals

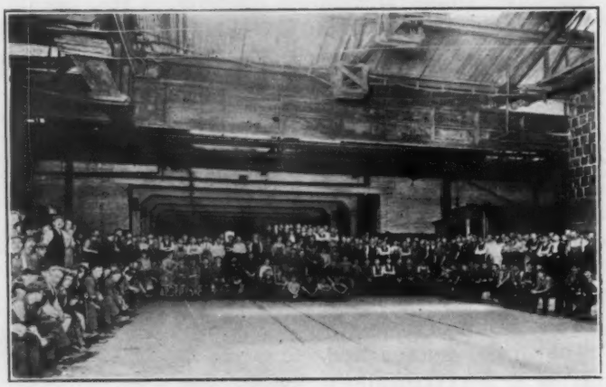
While the application of such a science and such an art to industrial purposes is only beginning, and while devices are compartively crude as yet, it must repeatedly be emphasized that no great progress will be made in industry as a whole and none at all in individual organizations without sympathetic imagination on the part of managerial executives. This cannot be stressed too much. This quality is the ability, in homely phrase, to "put one's self in the other man's place." When the owners of industry, and the highest managerial executives who are, after all, responsible for everything that goes on in industry, shall achieve this quality, it can and will be made general throughout industry.

It must be emphasized that this is a vital necessity, that it is not sentimentalism, that its application is intensely practical and realizable, that it has been proved in admirably effective industrial practice. It must also be emphasized that such an attitude of sympathetic imagination cannot function automatically—that it requires definite organization and the practice of a definite technique to carry it into successful execution. This technique is the "personnel work" already described.

Will This Stimulate Imagination?

Just as the general manager was deeply offended when one of his board of directors criticized his methods to a department head in the factory and so undermined confidence, so such a general manager and all general managers should have the imagination to perceive that as **his** individuality was not respected, the same fundamental principle was being violated in cases where other men in the plant felt their individuality just as keenly. It was violated when that same general manager issued an order directly to a foreman under a department head without consulting the latter. And down the scale further it was violated when a workman was curtly criticized by a foreman for a poor piece of work for which he had not been allowed to select proper materials.

This principle is ignored in innumerable ways in almost every industry, and to the degree to which



NOON MEETING OF SHOPMEN

Effective personnel work with the Philadelphia Rapid Transit Company has transformed a condition of poor service, no extensions, bankruptcy, no dividends, and strikes to one of unparalleled courtesy and service, high wages, complete extensions, a surplus, regular dividends, no strikes and the death of a once powerful union which the men felt had no longer a function to perform.

it is ignored is that institution a humanly inefficient —and therefore a generally inefficient organization.

Henry Jones and John Smith—Workmen

John Smith waited at the factory gate with a miscellaneous crew of the unemployed. A clerk came to the gate shortly before the whistle blew, looked over the men casually and beckoned to seven. John Smith's name was written on a sheet by the clerk, and he was told to go to a certain part of the plant and see the foreman. After wandering around the place for a time, he finally found the department and the foreman. The latter looked him over with something of a sneer, passed a disparaging remark about his rather slender "build," asked an impatient question or two about what work he had done, cursed the hiring clerk for the kind of men he had been sending him and, because he was harried with a hundred vexatious details and pressed to get work out in haste, put John Smith on a job with a few minutes' introductory explanation, little of which Smith understood. The men near him were being driven and had little time to help him. Besides they were surly, for Smith had taken the place of a man they had liked and who had been summarily fired.

Smith did the best he could, but he made many mistakes. He had to solve practically every problem by the trial and error method or by watching other men. The foreman called him a "fool" and a

"boob" because of spoiled work. The foreman's work was not well organized and Smith was idle many times because of lack of material. A department head railed at "soldiering" to another official within Smith's hearing while looking at him significantly.

Smith was ambitious. He had read, in a flowery and benign statement made by the general manager in a trade organ and for public consumption, that the firm always promoted its men wherever possible and that it hoped every man would try to improve himself so he could qualify for better jobs. Smith had become a fair workman, largely through keen observation and interest in mechanical things. He saw a job ahead in which there were sometimes vacancies. He believed the general manager was sincere. He went to a technical school in the evenings and also took a correspondence course, studying those things which would fit him for the coveted job ahead. A vacancy occurred. Officials asked hurriedly and casually if any one had had any experience in the work. There was no record to show John Smith's hours of hard preparation and his genuine interest. A man was hired from the outside.

John Smith had a multitude of such experiences. He grew daily more cynical and embittered. He also grew careless and indifferent. One day he was given a piece of work in which he was rather interested. He plunged into it. Material was held up. The foreman passed by him, saw him "loafing," yelled at him and there was a bitter altercation. Smith was fired.

By Way of Contrast

Henry Jones heard of a chance to work in a plant where one of his friends, an employe, praised the management and the good working conditions. He went to the plant, entered an attractive waiting room and was carefully and sympathetically interviewed by an employment manager. His qualifications, exact experience and especially his desires and ambitions were recorded in detail. He had expressed an especial interest in one type of work, and in a few days he was called back and employed at that work. Before he was put to work, however, he was given an attractive booklet telling something of the company, its products, its policies, especially toward employes, the regulations that were in force and the reasons for them. He was then shown about the section of the plant in which he was to work and told in some detail about the place of his new department in the plant organization. The employment manager personally introduced him to the foreman who greeted him and introduced him to his fellow-workers.

Jones was carefully trained in an unhurried fashion. He was treated by his foreman in a way that commanded mutual respect. The foreman was himself well trained and realized the responsibilities for teaching and leadership in his job. Jones was occasionally tried at different kinds of harder work. A vacancy in another department occurred. The work was a bit unusual, but he had had some experience with a similar job in another plant. The fact was on record in the employment office, and so Jones' qualification was revealed when the cards were examined before the vacancy was filled. He was tried on the new job and given some additional training. He made good.

Jones heard talks occasionally about the larger aspects of the work of his department given by the department head or another official. He read articles in the employes' magazine about other departments and how the work of his department fitted in with them. He read and liked the other plant news. He rapidly absorbed the company spirit, and "we" and "our" were often on his lips. He was deeply interested in the employes' organization.

In a hundred other ways Jones found himself and grew. He believed in himself, in the organization and the management. He was happy because he was contented, and he was contented because he was not suppressed by the industrial machinery. The vision of the executives had shown them that this state of mind on the part of Henry Jones and his fellows was the only one through which the organization could approximate its full effectiveness.

Reporting Downward

A happy phrase which embodies something of this new philosophy is that of "reporting downward" in industrial management. The necessity of reports upward from subordinates to superiors has been traditional; these are obligations about which there has been no question. But the management which realizes the value of the reverse process and puts it into practice will reap large rewards.

"Reporting downward" involves giving information to subordinates about what is happening above them in the organization. It is widening their horizon and powerfully enlisting their interest and therefore their intelligent cooperation. It satisfies their craving to know more about the process of which they are a part. It is adding definitely and largely to their dignity and self-respect. Such a practice can go a long way toward achieving industrial partnership between management and men.

An Untapped Reservoir

Probably most of the great revolutionary advances that can be made in industry through technical research and improvement have been made. The possibilities that are open through the fullest utilization of the human resources of industry and commerce cannot yet be conceived, but the challenge to enlightened management is clear. An "enlightened" management is not only management with vision, but it is above all management with imagination.

Roger Babson's recent pronouncement on this subject is most timely:

> We are never going to be able to shift the responsibility for industrial peace on to the shoulders of others or to put it on the state. This means that the employer must put thought in the place of force and that some of the same intelligence that has gone into the perfection of mechanical equipment must be given to machinery for gaining and keeping industrial peace. The big costs in the next decade are going to be for this kind of work.
>
> This thing touches industry at all points. In the fierce competition of the next ten years the plant with a thoughtful labor policy will be able to get out its product, to market it, to sell its securities, to satisfy its stockholders. Other plants will fail at some or all of these points. It is therefore time now for intelligent employers to hang up the tomahawk and take down the neglected machinery for industrial peace.

How Electric Rates are Fixed Under Commission Regulation

An Analysis of the Methods Employed by the California State Railroad Commission in Determining the Basis Upon Which Returns Are to be Allowed and in Distributing the Burden Fairly Between Classes of Service

by LESTER S. READY
Assistant Chief Engineer, California Railroad Commission

EXPERIENCE has shown that the business of rendering electric service must be monopolistic in character. As an outgrowth of this situation, public regulation has come into being. Its function is to insure reasonable rates and service to the public and at the same time provide just compensation for the service rendered, to the end that under efficient management and sound financing, adequate service may be continued and expanded to meet the growth of the community.

In California where the network of interconnected systems and the diversity of business throughout the state make this plan feasible, the general policy followed by the Railroad Commission has been toward uniform schedules extending over the entire territory served by one utility. This has favored an even development of the state as opposed to congested industrial districts and has been of particular benefit in stimulating agricultural prosperity.

Fixing rates for any class of electric service requires much careful study and consideration of:

1. Cost of service and its segregation between classes.
2. Value of service.
3. History of development of business under existing rates.
4. Elimination of discriminatory rates.
5. Psychological effect of different forms of rates on the public.

Cost of Service Basis of Rates

The cost of service as applied to the entire business of a utility is equal to the reasonable operating expenses plus allowance for depreciation and a reasonable return on or compensation for the money invested in the property used and useful in the public service.

Operating and maintenance expenses are determined for a given utility from a careful consideration of its actual expense and the reasonableness of same. Owing to variation in expense from wet to dry years, resulting from greater use of fuel oil in years of short precipitation, costs are based on average supply of hydro power. In the case of the Southern California Edison Company the utility has been required to account in a reserve fund for the reduced costs on wet years and increased costs on dry years.

An annual depreciation allowance is made to cover, during the estimated life of the various units of plant, the writing off of the original cost of the property at the end of the estimated life. The depreciation charge included in expense is, of course, at best based on estimates. In the more important recent decisions the utilities have been required to account fully to a reserve for the allowance and also earning at 6% on the balance in the reserve.

Eight Per Cent Return Allowed

The amount of capital on which a reasonable return is allowed is generally determined from an inventory and appraisal of the property used and useful in the service together with a careful audit of the company's books and records. In the main electric and gas proceedings lately decided the Commission has used as the rate base or capital on which a fair return is allowed the reasonable cost of the physical properties plus cost of organization and cost of franchises and water rights purchased by the utility. This figure has been materially less than estimated costs of reproducing the property under the conditions existing during the past several years.

The Railroad Commission has generally found that an annual rate of return of approximately 8% on the rate base is a reasonable compensation for the use of money invested in electric utility industries. A somewhat higher allowance has been made on moneys required to be invested during the period of high costs of money just passed and this accounts for the average rate of 8.3% allowed the Southern California Edison Company. This return covers the amount available to the utility to pay bond interest, amortization of bond discount and expense, interest upon accrued depreciation reserve invested in property, sinking fund requirements and the payment of dividends and for surplus. Actual results show that in the case of reasonably financed utilities this return has been sufficient to attract further investment for additions and extensions of system.

No Increases During Inflation Period

Generally speaking, total revenue and earnings of utilities under regulation have been limited in maximum to the above definition of cost of service. This was especially noticeable during 1918 to 1921, when the value of service greatly exceeded the cost and in most other industries far greater increases than could be justified by increased costs were made in the prices charged.

The determination of the cost chargeable to particular classes of service such as lighting, industrial or agricultural power requires a segregation of costs between those dependent on the demands made and the extent of use of each class. Certain costs, such as fixed charges on investment in transformers and electric generators, etc., are proportioned to the demand made by the consumer, while other costs such as fuel oil are largely proportional to the amount of energy used.

Each Bears His Own Burden

Segregations of costs between classes of service are at best approximations and the value of them is largely dependent on the information available and

the judgment of the persons making the analysis. An assumption generally made in segregating or prorating costs is that each class of service should share proportionally with others in the savings of diversified business. In a broad consideration of these matters, however, consideration must be and is given to the limiting costs. The maximum cost is that in which no credit is given to the limiting costs. The maximum cost is that in which no credit is given for savings in general or joint costs with other classes of service, and the minimum cost is that where the class of service is assumed as sharing in none of the joint costs. Between these limits there exists a considerable leeway in which judgment may be exercised and where other influences may be allowed for. Care has to be exercised, however, that any rates fixed will at least be such as to make a given class of service not a burden on others should it become the dominant or critical load on the utility's system. Failure to realize this fact prior to regulation has caused serious difficulties in the case of agricultural service on certain systems.

A Limit to What Consumer Can Pay

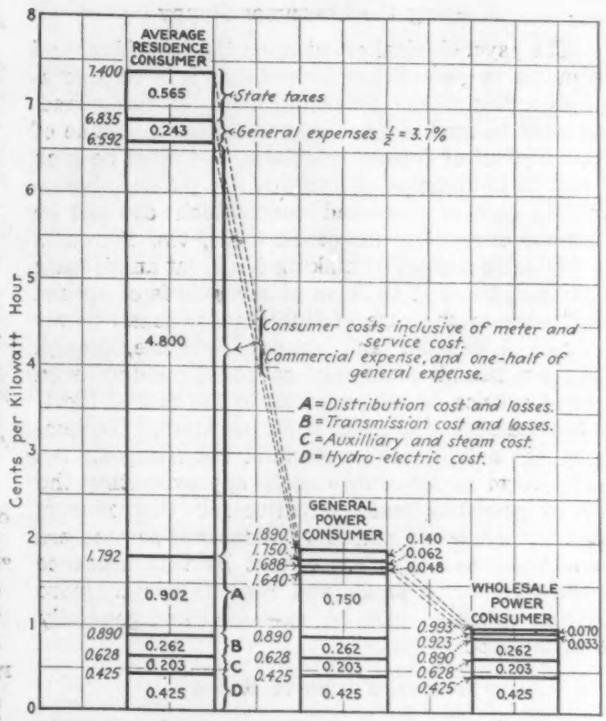
Rates based solely on a determination of the cost of service to the various classes must in many instances be materially modified to meet the economic limitation of the value of service rendered. Value of service in itself is somewhat intangible in nature, being affected by such factors as the quality of service rendered, cost of other sources of power such as gasoline, or Diesel engines, steam power, etc., or, where competing utilities exist, the rates of the other utility. Value of service is influenced also by costs to similar industries in other locations and also by the economic value of the product of a given industry. In fixing rates for service it is of vital importance that distinction be made between actual value of service and unwarranted claims by consumers that their power rates are causing failure.

The value of service in the instance of agricultural consumers is affected by competition with other forms of power, primarily gas engine, and with the ability of the consumer to continue to operate during periods of economic depression or by other influences which prevent profitable operation. Value of service in the instance of lighting consumers is generally much in excess of the cost of service from the standpoint of competition or other sources of lighting but is limited by the amount that consumers will pay for a given service. It has been found in general that regardless of the rates, a consumer's bill for lighting service will vary between narrow limits—if rates are reduced increase in consumption occurs, and if rates are materially increased reduction of use results. A more important condition which affects rates for lighting service is in its nature political. If other communities in adjacent or reasonably adjacent territory enjoy rates, for example, of 5 or 6 cents per kilowatt-hour, it is not possible from the policy standpoint for rates to be much more than 2 or 3 cents per kilowatt-hour in excess of the lower rates, and in sound regulation this must be given consideration.

In general, cost of service on electric utilities has been and even under present economic conditions is largely below the value of service when considered from the standpoint of competition or ability of classes of consumers to pay. In some instances industries have closed down during the present economic depression but this in general has been due to other conditions than power rates.

Former Rates Must Be Considered

Former rates in effect for a given industry or class of service must be given careful consideration in fixing new rates. Consumers often install equipment and make relatively large investments in consideration of the type of schedule in effect and radical change in schedule would be disastrous. Unless the conditions are entirely unreasonable and the result of the continuation of the given form of schedule such as to increase cost of service to the general consumers with further development of business on the existing forms, rates must follow somewhat the



COMPARISON OF COST OF SERVICE TO DIFFERENT CONSUMERS

The average cost per kilowatt-hour at different points of delivery on one of the large electric utilities in California as determined in a recent rate proceeding is illuminating from the standpoint of showing the variation in cost of energy from the hydroelectric plant to the retail consumer. The chart sets forth an analysis of the average cost per kilowatt-hour of power delivered. In the average costs are included the operating expenses, depreciation and return on investment of each part of the system considered. No segregation between demand or energy costs are made, the average costs per kilowatt-hour being shown. It is to be noted that the average cost of energy delivered from hydroelectric plants is 4.25 mills per kilowatt-hour; that to guarantee continuous service and supply that proportion of the power not available from hydroelectric plants in dry years the cost is increased to 6.28 mills per kilowatt-hour to cover interest, depreciation and operation of auxiliary steam plants. Transmission costs and losses bring the cost to 8.9 mills at the main transmission substations. When general expense and taxes are added the average cost of power delivered from the substations increases to practically 1c. per kilowatt-hour. The cost per kilowatt-hour is practically doubled in distributing from the substation to the average agricultural or industrial consumer having approximately 20 horsepower installed. The cost of energy to the domestic lighting consumer is largely in the local distribution and commercial costs owing to the retail nature of his use. Interest, depreciation and maintenance of the service and meter, handling of consumers' accounts and general expense chargeable to consumers' costs are a material item in the large increase in average cost from substation to consumer.

form previously in existence. On the other hand, this condition must not be allowed too greatly to influence future rates for the aim must be to construct rate schedules so that the growth of business will tend to make possible reduction in costs rather than cause increases.

Elimination of Discrimination

The elimination of discriminatory rates between consumers and classes of consumers has been a difficult and unpopular duty of the Commission. As the result of lack of information on the part of the commercial departments of the utilities in times past and the outgrowth of cut-throat competition, many rates have been such as to give special preference to certain consumers and have caused serious discrimination. The Public Utilities Act requires that such discrimination be eliminated and the necessary result has been dissatisfaction on the part of the consumers who have been forced to give up special rates.

Keeping the Consumer Happy

The psychological effect upon the individual and the public in general has to be taken into consideration in fixing rates. Scientific forms of rate schedules must be modified not only to reflect the value of service, effect of former schedules, but must be such as not to antagonize or irritate the public. Sometimes in case of increased cost which can not be overcome except by increased rates, two increases are advisable instead of making too great an increase at any one time. The form of schedule is of special importance in the case of lighting and small power service. A demand and energy schedule, though best from the standpoint of cost and possibly even value of service, is not advisable in the case of lighting service unless in effect from the start. Consumers do not or will not understand the charges. An energy form of schedule closely approximating the other is generally made effective for this reason. Rates for wholesale and large industrial service are not affected to any great extent by this influence as the number is small and reasons for a more scientific schedule can be explained and generally are understood.

General Forms of Rates

In practically all instances lighting rates are expressed as block energy schedules, reducing with quantity consumption. Power rates are expressed in the majority of instances as block schedules reducing for increasing demand and for increasing load factor or hours of use. This approximates more closely the cost of service. Rates for wholesale service and optional schedules for industrial power service are in general of the demand and energy form. This form of schedule more accurately charges each consumer the cost he incurs. Were it not for the difficulty of ready understanding on the part of consumers, this form would be most advisable for all service. In special instances where the load factor and quantity is practically constant, flat rates per unit of demand or a uniform energy rate per kilowatt-hour of use are fixed, there being no need of complicating the charges.

The following four schedules are typical of the main types of rate schedules:

SCHEDULE 1—GENERAL LIGHTING SERVICE

RATE:

First	30 kw-hr. per meter per month	9c per kw-hr.
Next	170 " " " "	7c " "
"	300 " " " "	6c " "
"	1,000 " " " "	5c " "
All over	1,500 " " " "	4.5c " "

MINIMUM CHARGE:

Inside incorporated municipalities	$1.00 per meter per month
Outside " "	1.25 " " " "

SCHEDULE 2—GENERAL POWER SERVICE

RATE:

Consumption per Horsepower		Rate per kw-hr. for connected loads of— 2 hp. to 4 hp.	5 hp. to 9 hp.	10 hp. to 24 hp.	50 hp. to 99 hp.	100 hp. and over
First	50 kw-hr.	5.5c	4.5c	3.5c	3.0c	2.8c
Next	50 "	3.0c	2.3c	2.2c	2.0c	1.9c
All over	100 "	1.5c	1.4c	1.3c	1.1c	1.0c

MINIMUM CHARGE:

First	10 hp. of connected load	$1.25 per hp. per month
All over	10 " " " "	1.00 " " " "

SCHEDULE 3—AGRICULTURAL SERVICE

RATE:

Demand Charge

Size of Installations	Annual Charge
1- 4 hp.	$16.00 per hp. per year, but not less than $30.00 per year.
5-14 "	14.00 per hp. per year
15-49 "	13.00 " " " "
50-99 "	12.00 " " " "
100 hp. and over	11.00 " " " "

Energy Charge

First	1000 kw-hr. per hp. per year	9c. per kw-hr.
Next	1000 " " " " "	8c " "
"	1000 " " " " "	7c " "
"	2000 " " " " "	6c " "
All over	5000 " " " " "	5c " "

OPTIONAL RATE:

Any consumer may select at his option the following rate instead of the demand and energy rate set forth above.

Annual Consumption per hp.		Rate per kw-hr. for connected loads of— 1 hp. to 4 hp.	5 hp. to 14 hp.	15 hp. to 49 hp.	50 hp. to 99 hp.	100 hp. and over
First	500 kw-hr.	3.0c	2.8c	2.6c	2.4c	2.3c
Next	500 "	2.0	1.8	1.8	1.8	1.7
"	1000 "	.8	.8	.8	.8	.8
"	1000 "	.7	.7	.7	.7	.7
"	2000 "	.6	.6	.6	.6	.6
All over	5000 "	.5	.5	.5	.5	.5

MINIMUM CHARGE:

First 10 hp. at $15.00 per hp. per year, but not less than $30.00 per year

All over 10 hp. at $12.00 per hp. per year

SCHEDULE 4—WHOLESALE POWER SERVICE

RATE:

Readiness-to-serve Charge:

First	200 kw. of maximum demand	$1.25 per month but not less than $250.00 per month.
Next	300 " " " "	1.00 per kw. per month
Over	500 " " " "	.90 " " " "

plus

Energy Charge:

First	100,000 kw-hr. per month	8 mills per kw-hr.
Over	100,000 " " "	7.5 " " "

Rights of Down-Stream Users on Interstate Rivers Sustained

Important Decision by the U. S. Supreme Court on Colorado-Wyoming Controversy Over the Laramie River Establishes Doctrine of Prior Appropriation on Interstate Streams Which Will Facilitate Early Development of the Colorado

By PAUL WOOTON
Washington Correspondent, Journal of Electricity and Western Industry

STIMULATION of development along the Colorado River, the simplification of the problem before the Colorado River Commission and a decided advantage to the states in the lower portion of the river's basin, are results expected to follow the opinion of the Supreme Court of the United States in the case of the State of Wyoming versus the State of Colorado, the Greeley-Poudre Irrigation District, and the Laramie-Poudre Reservoirs and Irrigation Company. The opinion sets up definitely, beyond the power of any appeal, the recognition of prior appropriation of water as obtaining between states which recognize that doctrine. It is a case of first come first served.

Since the lower portion of the basin is in a position to utilize the waters of the Colorado River more rapidly than is the upper portion of the basin, the effect of the decision is to benefit that section of the basin most. It reverses the advantage which had very generally been assumed to lie with the states in a position to intercept the waters before they could reach a user lower down. For instance, the Imperial Valley would be in a position to enjoin any use of water above by a subsequent appropriator which would tend to lessen the water flow in the lower valley, were such action to deprive prior appropriators in the Imperial Valley of water.

The fact that these large priorities have been established in the lower basin creates a great advantage for those who will develop the power resources of the Canyon sections of the stream. To keep prior appropriators supplied in the lower basin diversions above never will interfere importantly with the development of power.

There is some room for argument under this opinion, particularly in that California has followed a dual doctrine of priority of appropriation and the common law rule of riparian rights. There are other factors in the situation which may prolong the controversy but in view of this decision it is believed that the seven states in the Colorado basin will be much more ready to enter into an agreement for the utilization of the Colorado than was the case before it was handed down.

The opinion is a lengthy one, but for the most part it deals with the discussion of evidence in regard to the situation on the Laramie and Poudre rivers. Wyoming in this case contended that waters from an interstate stream cannot rightfully be diverted from one water shed to another which entirely removes them from entering a state formerly enjoying their benefit, and also that prior appropriations made at down-stream points should not be deprived of waters to which they had established a right and for the use of which they had made considerable investment. Colorado, on the other hand, claimed that it is the right of any state to dispose as it may choose of any or all of the waters flowing in the portion of an interstate stream within her borders, "regardless of the prejudice it may work" to other states below and, secondly, that states on an interstate stream have a right to an equitable division of the waters and that she had not received her share. Other specific claims were made and much of the evidence is highly technical. The high points of the opinion are set forth in the following excerpts:

> We conclude that Colorado's objections to the doctrine of appropriation as a basis of decision are not well taken, and that it furnishes the only basis which is consonant with the principles of right and equity applicable to such a controversy as this is. The cardinal rule of the doctrine is that priority of appropriation gives superiority of right. Each of these states applies and enforces this rule in her own territory, and it is the one to which intending appropriators naturally would turn for guidance. The principle on which it proceeds is not less applicable to interstate streams and controversies than to others. Both states pronounce the rule just and reasonable as applied to the natural conditions in that region; and to prevent any departure from it the people of both incorporated it into their constitutions. It originated in the customs and usages of the people before either state came into existence, and the courts of both hold that their constitutional provisions are to be taken as recognizing the prior usage rather than as creating a new rule. These considerations persuade us that its application to such a controversy as is here presented cannot be other than eminently just and equitable to all concerned.
>
> In suits between appropriators from the same stream, but in different states recognizing the doctrine of appropriation, the question of whether rights under such appropriations should be judged by the rule of priority has been considered by several courts, state and federal, and has been uniformly answered in the affirmative. Conant v. Deep Creek Irrigation Co., 23 Utah 627, 631; Willey v. Decker, 496, 534-535; Taylor v. Hulett, 15 Idaho 265, 271; Howell v. Johnson, 89 Fed. 556; Hoge v. Eaton, 135 Fed. 411; Morris v. Bean, 146 Fed. 423; Bean v. Morris, 159 Fed. 651. One of these cases came to this court and the judgment below was affirmed. Morris v. Bean, 221 U. S. 485. These decisions, although given in suits between individuals, tend strongly to support our conclusion, for they show that by common usage, as also by judicial pronouncement, the rule of priority is regarded in such states as having the same application to a stream wholly within one of them.
>
> The contention of Colorado that she as a state rightfully may divert and use, as she may choose, the waters flowing within her boundaries in this interstate stream, regardless of any prejudice that this may work to others having rights in the stream below her boundary, cannot be maintained. The river throughout its course in both states is but a single stream wherein each state has an interest which should be respected by the other. A like contention was set up by Colorado in her answer in Kansas v. Colorado and was adjudged untenable. Further consideration satisfies us that the ruling was right.

The principle of interstate rights established is of importance far beyond the appropriations involved in this suit, disposing as it does of the contention that a state has a right to dispose of all waters originating within its borders.

Why the Manufacturer is Interested in Retail Sales Problems

The First of a Series of Articles Devoted to an Analysis of the Modern Tendencies in the Marketing of Products and the Advantages of Different Types of Distribution Methods as Applied to Various Classes of Goods

By E. A. KINCAID

THE chief characteristic of modern industry is production for the market. Modern economic society is so organized that there is complete interdependence of individuals and concerns. The tendency is more and more in the direction of specialization of effort upon a product or a family of products and the production of a surplus. Economic activity of this character depends upon the market to absorb the surplus. This tendency is not limited to manufacturing for agriculture is becoming more and more specialized and producers of all sorts are thrown into direct contact with those problems which relate to the market.

When Production Exceeds Demand

The manufacturer is of necessity compelled to study the market and if he does so he will become aware of specific problems, among which will appear the present tendency for production to exceed demand. This is the result of many years of attention to the production side of industry during a period when the marketing problem was not acute. So long as production lagged behind the demand the market absorbed goods without serious difficulty. The chief problem of the manufacturer then was that of making production more efficient. It was not necessary to give much attention to the mechanism of distribution since it was at no time over-taxed and the movement of goods to consumers was sufficiently efficient to take care of all that manufacturers were able to throw on the market.

About 1880 this situation was reversed and production became so well developed that the existing mechanism of distribution did not always work well. With this change the manufacturer was confronted with the necessity of extending his range of vision so that it might include a view of the channels of distribution. When the supply exceeded the demand the market system tended to clog or actually break down and the producer of goods found his access to consumers cut off. This is the present status of industry and business and producers everywhere are giving more attention to the problems of marketing. There has developed a critical attitude on the part of consumers as well. For the failure of the marketing system to function well under new conditions has brought to light defects and inefficiency which were previously overlooked. The channels of distribution have, therefore, come in for critical consideration from both the producing and consuming sides. The attitude of the manufacturer with respect to markets and channels of distribution is, however, somewhat different from that of the consumer and for that reason requires the separate consideration which it will be given here.

The Periodic Business Depression

The manufacturer is, in the second place, compelled to be a student of marketing methods because of the operation of business cycles. The tendency of business to move from prosperity to depression and then to recover and work back to higher prices and better conditions places a real problem before the manufacturer. In periods of rising prices, during the positive phase of the business cycle, he is at all times confronted with the possibility that the peak of the price movement will be reached and that a business crisis, such as we had in 1920, will set in before he has disposed of his high-priced goods, that is to say, of goods manufactured from raw materials purchased in the period of high prices. If such a condition should come about the manufacturer is confronted with the necessity of a lowering of the valuations placed upon goods in his inventory. Many great plants have had to confront this problem during the past two years and some have seen their assets shrink so rapidly that their solvency was threatened. Still others have been brought to the verge of bankruptcy.

The Marketing Problem of Large Business

Because of the price cycle, inventories have to be marked up in a period of falling prices and then comes the marking down in the period of falling prices. Few concerns who have lived through this process during the past two years would fail to welcome reforms which would tend to mitigate the extremes of the cycle. Large-scale industry has the great advantage of a low cost of production per unit of output. That is the goal of all manufacturing enterprises. But large-scale industry requires large investment in plant and equipment. Against this investment of fixed capital interest charges constitute a fixed charge when the capital has been obtained through borrowing. The problem of industry is to hold down the fixed charges, including such items as interest, to a point which will be safely within the earning power of the industry in the period of depression.

Large scale industry and production for the market involve long-range buying of raw materials and the accumulation of goods to meet demand which will find expression in the near future, possibly six months or a year removed from the date of purchase of raw materials. Thus, the manufacturer is required to have an ample working capital. When price recession sets in and inventories shrink, losses have to be written off and these sometimes result in an impairment of the working capital to the danger point. The long swing of prices up or down therefore imposes upon all industry most acute problems, the solution of which calls for the highest qualities of financial leadership. In the period of falling prices the market loses its power to absorb goods on the previous scale and a manufacturer may find that he must cut down production to some fraction of the normal capacity. In the face of this con-

dition fixed charges continue at the old level. Hence there arises powerful incentive to examine the marketing processes in order to determine the possibilities of stimulating demand. If at such a time demand can be stimulated the per unit cost of production can be held down and the operating ratio may be held well within the danger point. The business depression, therefore, acts as a stimulant of efforts to find channels of distribution which will continue to carry the full output of a factory to the hands of consumers.

Holding a Market Against Competition

In the third place, the manufacturer is to study the marketing system because of the pressure of competition. He may have a good product or family of products and these may be well known to the consuming public, but there is at all times the danger that competition will cut into an established market. An analysis of the marketing system used by a manufacturer for many years may lead to the conclusion that a more effective plan of distribution can be worked out. This may involve attempts to strengthen the existing channels of distribution and it may result in the development of a totally new plan of distribution. At any rate the exigencies of competition in a period of business depression such as we are even now confronted with tend to develop in the producer of goods a critical attitude with respect to the marketing system. The great problem is at all times that of getting effective distribution and it is more acute in the time of depression because at such a time competition is more acute.

The Rise of the Direct-to-Consumer Appeal

In the fourth place, the manufacturer is vitally interested in the distributive system because he finds it necessary to control the movement of his goods until they are in the hands of the consumer. When a sale is made from the factory to a middleman the goods pass into the hands of a firm which has interests that are not in all respects identical with those of the manufacturer. The orthodox system of distribution included the movement of the goods from the hands of the manufacturer to those of the wholesaler and thence to the retailer and finally to the consumer. So long as consumption exceeded the demand the wholesaler was anxious to obtain goods and there was no check in the movement of goods because of the distributive system. But when the conditions changed the wholesaler found himself besieged with the manufacturer's salesmen and he frequently carried many competing lines of goods in his stock. Thus it came about that the wholesaler pushed some goods and failed to push others with most disastrous effect upon those manufacturers who found their access to markets thus impaired. The lowest cost of production per unit called for the absorption of the full output of a factory and this could not be obtained without the fullest cooperation on the part of middlemen. It is a direct result of this condition that manufacturers have developed brands and national advertising as devices to create consumer-demand which will move goods in the face of inefficient cooperation on the part of middlemen. It is now well understood that the manufacturer cannot rest when he has manufactured his product and turned it over to the wholesaler. He must see to it that these intermediaries function.

Present Methods of Distribution

As a result of the tendency of production to outstrip demand, the production of a surplus for a market, the specialization in industry, the tendency to low per-unit costs attendant upon a large-scale industry, the swing in the price cycle, the competition between producers of like products and the breakdown of the orthodox system of distribution there has grown up new methods of distribution and we now find that goods may pass from the manufacturer to the consumer in any one of the following ways:

I. From the manufacturer direct to the consumer
   1. Through solicitors or canvassers,
   2. By mail,
   3. Through the manufacturer's own retail stores, usually chain stores.

II. From manufacturer direct to retailers
   1. Through the manufacturer's salesmen or by mail,
   2. Through one or more of the following kinds of retailers:
      a. Country general stores
      b. Specialty stores
      c. Department stores
      d. Chain stores not owned by manufacturer
      e. Mail-order houses
      f. Cooperative buying organizations of retailers
   3. Through all retailers of a given class who will buy,
   4. Through one retailer in a locality.

III. From the manufacturer direct to wholesalers
   1. Through salesmen or by mail,
   2. Through all wholesalers who will cooperate with the manufacturer,
   3. Through selected wholesalers having exclusive agencies in a restricted territory.

IV. From manufacturer direct to special representatives who are not normal parts of the marketing chain such as
   1. Agents,
   2. Commission men,
   3. Brokers,

   who sell to wholesalers, retailers or consumers.

Necessity for Scientific Analysis

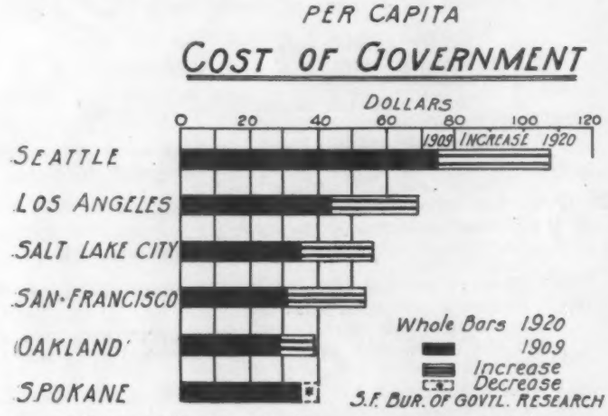
Just which one of these channels or combination of channels will be resorted to by the manufacturer in his efforts to command an adequate market will depend upon (a) an analysis of his product or products and upon (b) an analysis of the market. The necessity of making such analyses has now become so well recognized that many manufacturers have adopted the scientific approach. They have engaged the services of experts who have gathered and sifted the necessary data upon which a logical system of distribution could be worked out. Thus it has come about that many factories have research departments whose business it is to ascertain the facts needed to construct an efficient system of distribution. The facts thus obtained have frequently pointed to a system of distribution very different from the simple orthodox channels which for long dominated distribution and which are still largely used. As new products are introduced and new wants are developed the marketing mechanism is likely to become more complicated rather than less so. There is now no traditional system of distribution which exists on the merits of past performance alone. On the other hand there is a tendency to develop any system which will get that distribution which is essential to the efficient operation of the manufacturing plant.

Are We Getting an Adequate Return for Our Municipal Taxes?

It Will Pay the Business Man to Study the Following Analysis of the Costs of Government in the Major Western Cities, With a View to the Returns Which Industry Is Getting From the Taxes It Pays

By WILLIAM H. NANRY
Director, San Francisco Bureau of Governmental Research

THE great increase in the cost of government in recent years is due to: (1) the low purchasing power of the dollar; (2) the cost of debt incurred in previous years, or by previous generations; (3) the need for addition and expansion of governmental services; (4) the necessity of making improvements, deferred during the last decade; (5) the inequitable distribution of the tax burden; and (6) the losses and waste due to irresponsible organization, archaic methods and complicated procedure.



The capital expenditures of Seattle in its various municipally owned enterprises are responsible for the higher per capita costs of government.

The first two are not subject to our control; the third and fourth can, at best, be only temporarily postponed; only the last two are within our power to correct.

Increases Which Are Justified

It must in all fairness be recognized that changing conditions and community sentiment during the last twenty to thirty years have required a tremendous expansion in governmental activities. This condition has been general and is not peculiar to any one city or section. Census Bureau compilations show that governmental cost payments for the 146 largest cities of the United States have risen from $514,200,000 in 1903 to $1,113,600,000 in 1919; from $24.34 per capita to $34.60.

A large part of the increase is in reality only a "book cost." Expenditures for education, playgrounds, sanitation, widows' pensions, child hygiene, fire prevention and similar functions which have been initiated by municipalities, produce returns in better citizens, lives and property saved, crime prevented, misery abated, etc., more than commensurate with the amounts expended. The average citizen has little complaint of expenditures for purposes such as these. His complaint is of the cost of politics, waste, and ineffectiveness in government where these exist.

Misleading Comparisons

No article such as this can adequately analyze a number of cities. It can only point out how they vary from each other, and from averages, in their expenditures for the many functions incidental to municipal government. Each city is peculiarly itself, with many of its problems strictly local. One point should be stressed, however, and that is that the popular rating of a city's economy or extravagance according to its tax rate is worse than misleading. A city tax-rate depends on the ratio of assessed value to full value, the amount of revenue from sources other than taxation, whether state, county and school taxes are raised by the city, and whether all current expenses are included in the tax rate or are partially covered by the issuance of bonds.

The only measure of the efficiency of governmental expenditures is the return in service to citizens for taxes paid; this can be accurately evaluated only by a scientific survey. Comparative expenditures of various cities, if reduced to per capita costs, are valuable principally because of the questions they raise as to the soundness of the municipal program—whether too much or too little is being spent for schools, health, fire, police, highways, etc., and whether the allotments to each are disproportionate.

Per Capita Costs for Western Cities

The only basis for such fiscal comparison is furnished by the Census Bureau's "Financial Statistics of Cities"; these have been developed and improved over a long period of years and are strictly authentic. One of the accompanying charts based on these Census Bureau compilations, shows the "Per Capita Cost of Government" for six western cities for 1920 and for 1909, and the increase from 1909 to 1920. "Per capita cost of government" includes all costs — expenditures based on the annual budget, which are funded by taxation and miscellaneous revenues, and in addition improvements financed by special assessments, utility enterprises financed out of rate revenues, etc.

The six cities shown and their "per capita cost of government" are Los Angeles, $69.20; San Francisco, $53.04; Seattle, $107.72; Oakland, $38.74; Salt Lake, $56.23; and Spokane, $35.20. Denver and Portland are not shown, as data for these are not included in the Census Bureau's 1920 advance sheets. The average amount of increase for 1920 over 1909 is 43%. Only one city shows a decrease—Spokane, from a per capita cost of $39.83 in 1909 to $35.20 in 1920. Seattle is still far the highest, with a "per

capita cost of government" of $107.72. In 1909 its per capita cost was about 72% greater than that of Los Angeles, the second highest city. In 1920 this excess had dropped to 55%.

The per capita costs of the several cities are shown in the following table, which also shows the total cost by main divisions: expenses of general departments, interest payments, outlays, and expenses of public service enterprises:

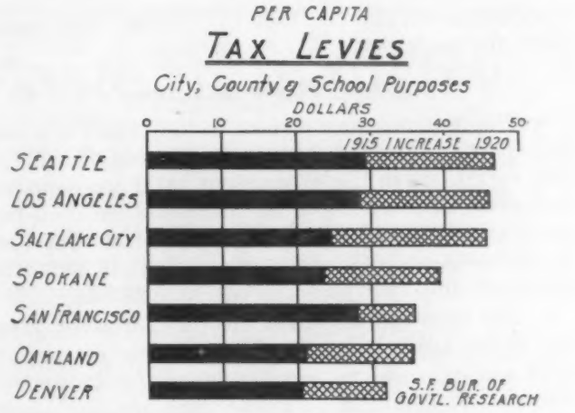
PER CAPITA COST OF GOVERNMENT

		Total	Gen'l Gov't	Interest	Outlays	Public Service
Seattle	1920	$107.72	$38.23	$10.22	$34.26	$25.01
	1909	74.16	13.60	5.06	53.66	1.84
Los Angeles	1920	69.26	36.94	4.23	20.62	7.41
	1909	43.19	12.43	1.46	28.12	1.18
Salt Lake City	1920	56.23	26.43	5.56	21.90	2.34
	1909	35.35	13.31	2.79	17.30	1.95
San Francisco	1920	53.04	31.80	4.78	12.14	4.31
	1909	30.96	20.78	.25	9.93	
Oakland	1920	38.74	30.36	2.65	5.26	1.07
	1909	29.00	15.07	1.10	12.80	.03
Spokane	1920	35.20	25.14	4.40	3.88	1.78
	1909	39.83	13.11	2.93	22.66	1.13

Putting Off the Evil Day

The principal disparity in the per capita costs of the various cities is occasioned by the varying amounts expended by each for "outlays" or capital expenditures. This item is the only one of the four that shows a decreased per capita cost for 1920 as compared with 1909, San Francisco furnishing the only exception. The decrease in this item is probably due to the fact that increased costs for routine activities had to be met and new services had to be provided for; the funds required for these were provided, partly by increased taxation and partly by decreased capital expenditures. This has involved the deferring of municipal improvements, and structures, to the extent that construction has been postponed beyond actual needs; it has tended toward public inconvenience and higher operating costs, and will require material additions to the cost of government in the near future.

Seattle, with the highest total per capita cost, is also highest in each of the four main divisions. The disparity in "expenses of general departments" is not as great as for "outlays" and "interest payments" but the disparity in expenditures for public service enterprises is very marked. These jumped from $1.84 per capita in 1909 to $25.01 in 1920. Seattle in 1920 spent almost 50% per capita more for public service enterprises than the other five cities combined.



The best measure of cost to the property owner is the "per capita tax levy." This eliminates such items as are covered by bond issues and gives an idea of the running expenses of government.

Where the Money Goes

Of greatest interest to tax payers from the standpoint of reducing costs, are the per capita "expenses of general departments." These include, in the approximate order of size of expenditures: schools and libraries; fire, police and other protective agencies; highways, including lighting; general government (executive, legislative, judicial, fiscal, etc.); health and sanitation; charities, hospitals and correction; recreation; and general and miscellaneous (widows and employes pensions, etc.). The greatest increase is shown for schools. Los Angeles' expenditures for this purpose have more than doubled; San Francisco shows the smallest increase, approximately 25%. The major increases, after schools, have been registered by the so-called social expenditures, such as health, charities, hospitals, correction, recreation, etc.

The latest available figures segregating the "expenses of general departments" are those for 1919. The following table shows for each of the six cities and also for Portland and Denver, the total "per capita expenses of general governments," the segre-

PER CAPITA EXPENSES OF GENERAL DEPARTMENTS

		Los Angeles	San Francisco	Seattle	Portland	Denver	Oakland	Salt Lake	Spokane
TOTAL	1919	26.63*	24.09	26.42	23.78	22.00	19.90	19.94	19.88
	1909	12.58	20.79	14.17	11.12	18.06	15.21	13.33	13.13
General Government	1919	3.18	3.24	3.86*	2.79	2.83	1.38	1.69	1.16
	1909	1.06	3.29	1.83	.80	3.22	1.58	1.92	1.33
Police, Fire, etc.	1919	4.39	6.81*	5.65	4.61	3.28	4.12	2.67	3.70
	1909	3.04	7.06	3.40	3.11	3.44	3.34	2.12	2.59
Health and Sanitation	1919	1.55	2.35	2.96*	1.37	1.25	1.38	1.87	1.93
	1909	.85	1.53	1.24	1.14	1.09	1.58	1.56	1.57
Highways	1919	3.46*	1.68	2.61	4.30	2.52	1.54	1.84	2.21
	1909	2.18	2.03	1.17	1.21	2.15	2.62	1.33	1.47
Hospitals and Correction	1919	1.74	2.45*	1.45	.82	1.30	.20	.23	.37
	1909	.15	1.47	.19	.02	1.24	.02	1.00	.13
Schools and Libraries	1919	11.33*	5.58	8.61	8.72	7.93	9.88	10.13	9.33
	1909	4.69	4.30	5.38	4.44	5.55	5.46	5.05	5.63
Recreation	1919	.62	1.02	.50	.63	1.68*	1.09	.86	.79
	1909	.55	.93	.40	.29	.85	.45	.29	.32
General and Miscellaneous	1919	.36	.96	.68	.54	1.21*	.31	.65	.39
	1909	.06	.18	.56	.11	.52	.16	.06	.09

* Highest

gation thereof, and the 1909 comparative segregated costs for each city.

Seattle Leads in Taxes

The best measure of cost to the property owner is the "per capita tax levy." By the use of this factor, variations in the assessment ratio are equalized and costs that are borne by sources other than taxation—such as special assessment or bond fund improvements, and utility operations that are supported by users and rate payers—are eliminated.

The 1920 "per capita tax levies" for seven Western cities are tabulated below to show comparison with and increase over similar figures for 1915 (1909 figures not available). These data are also shown in the second chart accompanying this article. "Per capita tax levies" for state purposes are omitted to facilitate comparison, inasmuch as the three California cities levy no taxes for state purposes. These per capita levies for state purposes by cities outside of California are as follows: Seattle, $10.01; Denver, $5.02; Salt Lake, $8.63; and Spokane, $12.59.

PER CAPITA TAX LEVIES

	1920	1915	Increase
Seattle	$46.60	$29.28	59%
Los Angeles	45.48	28.47	60%
Salt Lake	45.24	23.71	91%
Spokane	39.36	23.27	69%
San Francisco	36.06	27.89	29%
Oakland	35.59	21.11	69%
Denver	31.87	20.23	57%

Need for Business Analysis

The statistics in the foregoing are not offered in any critical sense. If they will serve to enlist the interest of some of the business, technical or professional men in the several communities, their full purpose will have been served. The time has long since passed, when community affairs could be considered, by reason of public apathy, as the sole business of the politician. Increased tax bills have forced public interest in public affairs; there is a general feeling that something is wrong, but a lack of knowledge as to just where the defects lie and how they can be corrected.

If business men will take the time to familiarize themselves with the government under which they live—assuming that they live in an average community—they will readily recognize that the root of the whole trouble is the uncoordinated, clumsy organization, in which no one is wholly responsible, which actually develops the procedure known as "passing the buck," but which blunders along despite its cost and lack of reasonably-to-be-expected effectiveness only because it is supported by the bottomless well tapped by the power to tax.

Marine Fuel Problem for the Pacific Coast

By D. DORWARD, JR.

The greater part of the fleet of vessels now operating from Pacific Coast ports of the United States use oil as fuel. With the exception of Australian and Japanese bunkering ports, coal supplies for replenishing bunkering stations are brought from very distant points of origin so that the cost of bunker coal at foreign stations, and even at Pacific Coast ports, is very high — so much so that even at the present prices ruling for fuel oil, the oil fired vessel is the most cheaply operated from a fuel standpoint.

Growing Use of Oil for Shipping

Statistics show that at the beginning of 1920 the world's merchant shipping approximated 55 million tons, of which tonnage approximately 9 million tons is already on an oil burning basis. The navies of the world are largely on an oil burning basis, for the advantages of oil over coal for naval operations are of the utmost importance and undeniably make for greater efficiency. About five million barrels are required annually for the American Navy.

It is now more than evident that oil for merchant marine transportation has assumed a standing of the utmost importance. It has been conceded by well known authorities that the strength of this demand is such that if necessary it can and will divert from industrial purposes the quantity required for shipping interests. At any rate, the significance of oil in maritime matters explains to a considerable extent the present world wide interest that has been shown in oil.

Even at this stage it is significant that coal is now being brought from Australian ports in American vessels using oil as fuel; and large steamship companies having many vessels usually confine that portion of their fleet operating in Pacific Coast waters to those vessels fitted for oil burning.

Fuel Oil Production Decreasing

California produces between one quarter and one fifth of the world's supply of petroleum oils and one third of the United States' supply. Approximately 60% of the crude oil produced in California is refined, at least in part, before being utilized. The increased demand for gasoline and lubricants and the rapid strides in refinery efficiency are resulting in the refining of a constantly increasing proportion of the oil with a resultant smaller quantity available for fuel purposes.

The demand for refined oil products is rapidly increasing and will be accelerated by the potential oil shortage in other fields of the United States and by the necessity of using California oils to offset this shortage. To meet this increasing demand, California oil must be used more efficiently and sparingly.

Hydroelectric Power for Industry

The consumers of petroleum oil, in short, are now facing a condition of decreasing production and increasing demand, which condition points inevitably to the necessity of developing other sources of fuel for power. Hydroelectric plants can aid materially in the conservation of fuel oil by the production of power. Industrial plants, railroads and similar institutions will eventually have to find other sources of power than that developed by fuel oil, in order to supply the increasing demand for marine purposes.

Eliminating the Waste in Industry

Shortcuts in Management and New Power Applications Which Have Been Adopted in Western Industrial Plants for Eliminating Waste, Increasing Production and Cutting the Cost of Manufacturing Processes

Electric Furnaces Save Freight and Promote Local Industry

The National Carbon Company of San Francisco originally secured its entire supply of high calcined coke from the Niagara territory because the calcining industry had originated to a large extent in that territory.

Several years ago, after a careful investigation of the heavy freight charges which they had to pay in transporting this coke across the continent, and after an investigation of a suitable source of electric energy, it was decided to install electric furnaces in San Francisco and to calcine their own product at their western factory.

These furnaces, each of 600-kilowatt capacity, were diverted from unused equipment at the Scranton factory and set up in a specially designed building in San Francisco. The three furnaces were of the single phase type. A special contract had to be entered into with the Sierra and San Francisco Power Company by the terms of which an independent line was built to the Carbon Company's plant directly from the power company's station so that the demand of these furnaces would not affect the power company's distribution system.

Th e National Carbon Company advanced the cost of this pole line to the power company. This advance was compensated by the power company's refunding 20% of each of the monthly bills. Three furnaces have been in operation for two years and give the most complete satisfaction to the company. With the freight differential as a margin, the coke is manufactured locally at a smaller cost per ton and in addition this installation has furnished work for local labor and an outlet for approximately 1,500,000 kw-hr. of electric energy annually.

THIS DEPARTMENT

will be devoted to a discussion of the various problems of waste in industry as they affect western industrial plants. Readers are asked to aid in the solution of the most vital problems facing industry by sending in accounts and pictures of the various practices for combating waste, which have been adopted in plants with which they are familiar. It is only by thus cooperating with Mr. Leurey that the fullest service can be rendered. Space rates will be paid for all material which is published.

CENTRALIZED CONTROL ESSENTIAL FOR EFFICIENCY

This combined switchboard and starting station in the warehouse of the California and Hawaiian Sugar Refining Corporation refinery at Crockett, California, controls from a single position the entire conveying system from the warehouse to the refinery. Not only has this cheapened the total cost of the installation, but has proved to be a waste saver by centralizing the control of the conveying system and thereby eliminating expensive jams on the conveyors whenever a shutdown occurred.

Better Contact with the Public Essential for Utilities

Several executive heads of northern California power companies were recently discussing matters of interest to their respective companies when one official ventured the statement that nothing was worthy of more consideration than the company's contact with the public, not only through its executives but through each and every employe who actually comes into contact with the consumers of electricity.

This executive had studied the causes which lead to misunderstanding and to the multiplicity of complaints, both small and large, which had to be dealt with at the general office and he said that a great many of these complaints would never have originated had the employes on the contact line been supplied with the information which finally had to be supplied from the executive departments at much greater effort and expense.

This executive stated that his company was preparing a plan by which each employe coming in contact with the public, regardless of his capacity and class of duties, would be educated to the point where he could supply all necessary information such as the fundamental rates and general conditions of service which obtain on the power company's system and intelligent information as to bills rendered and an explanation thereof whenever this information was required.

Every man who has done business with power companies or manufacturing companies of any character has experienced at some time the exasperation and the loss of time both on the part of the customer and on the part of the vending company, in attempting to get fundamental information which only results in the inquirer's being referred from department to department until, when the information is finally secured, his patience is often at an end.

Executives are now coming to see the fact that regardless of the special duties for which the employe has been retained, he is first and foremost in the eyes of the public a representative of the company and the public will not condone the fact that they cannot get simple information from him.

The task of educating all of the front line employes of a large corporation seems at first blush a rather gigantic task to tackle, but when it is considered

that the public as a rule is only interested in a comparatively few facts with regard to the power company or other company operations and that these facts generally relate to rates, prices, or conditions of service, the thing undoubtedly can and should be done, and the large public utilities of California would be the logical groups to start this character of public service.

A training of employes along these lines would serve the triple purpose of reducing complaints, promoting new business and would to a great extent increase that most desirable of assets—the good will of the community.

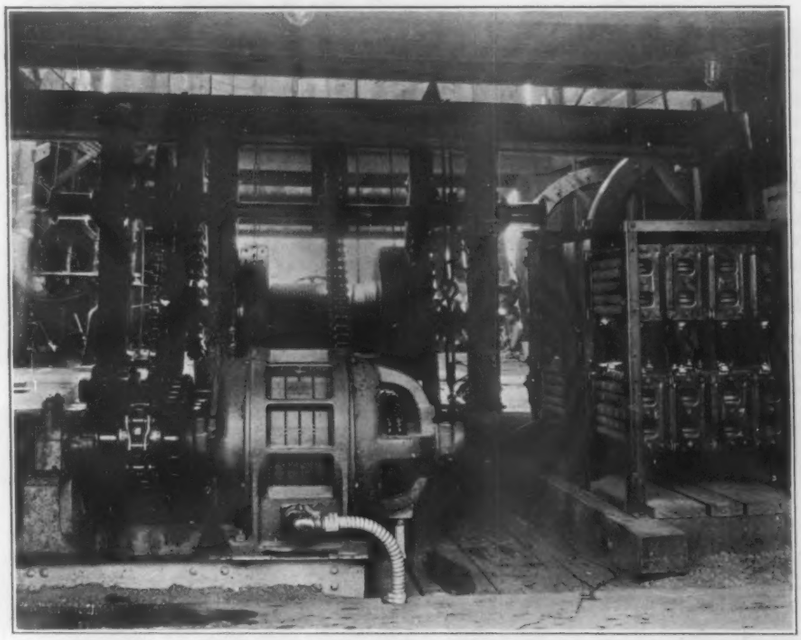
High Starting Torque Essential for Motor Drive

Study of Requirements of Duty and Proper Choice of Type of Machine Will Greatly Reduce Mechanical Repairs

In all types of factory installation there is, unfortunately, too little knowledge of the actual requirements of motor drive and an enormous amount of waste has resulted from the improper application of motors not designed for the conditions under which they must work. In general practice there are two common types of alternating current motors—the squirrel cage motor, which has a moderate starting capacity, sufficient for the great majority of loads which are encountered in daily practice, and the wound rotor type, that it will practically take all slack from the gear train before it actually starts bringing the machine up to speed.

On a large draw bridge on the Feather River the drive gear was wrecked several times, due to this condition, even with a wound rotor motor installed, until sufficient resistance was inserted in the circuit, after which all starting and maintenance troubles from this source disappeared.

A very similar case occurred in a cement plant where a large squirrel cage motor had been originally installed to



In addition to their capacity for heavy starting duty, wound rotor motors offer the additional advantage of variable speed over a wide range. This motor is performing variable speed service under trying conditions in the California oil fields.

equipped with external resistance and especially adaptable where a starting condition is inherently high and out of proportion to the running duty. Where the starting conditions have not been analyzed the tendency is to choose the squirrel cage motor and to over motor the installation in an effort to solve the starting question. This practice is especially fatal in classes of drives where a considerable amount of gearing is inserted between the motor and its load, and invariably results in the rapid destruction of the gearing and costly stoppage and replacements.

In all of these cases the wound rotor type should be installed and it should be equipped with sufficient resistance so drive certain machinery. Following this more equipment had to be added, the starting characteristics of which were very heavy compared to the running load. A great amount of trouble occurred from the use of the induction motor, necessitating excessive maintenance and very costly shutdowns. In this case, fortunately, the squirrel cage motor was of such a type that the rotor could be rewound and the original converted to the heavy starting type. This rewinding cost $1200 against the cost of approximately $2200 for a new wound rotor motor, and the substitution was made without material cost of time. In one year following the replacement of the squirrel cage rotor no repairs have been necessary and no interruptions have occurred on this installation.

A considerable waste is going on in most industrial plants due to this condition of over motoring to produce sufficient starting capacity with squirrel cage motors, and in many cases this has resulted in increased cost of energy, increased standby charges, and increased maintenance cost, which would be more than sufficient to equip the drive with motors of the proper type.

Electricity Removes Necessity of Standby Boiler Service

In considering the use of electricity for heating, too many industrial plants dismiss it as an impossibility on the ground of its apparently high cost. Many of these plants are very large users of electric energy annually and any addition of electric usage which comes on top of the plant's general use is obtained at a very low rate.

In a western milling plant, due to the general change from steam to electric drive, it became necessary to maintain one boiler for the purpose of taking care of water heating in the wash rooms of the factory and of the office heating. This boiler service required the attendance of two men and used an excessive amount of fuel oil due to firing a comparatively large boiler unit for small usage of steam. It was decided to install electric heaters in the office and an electric water heater in the wash rooms.

The energy for these heaters was taken from the main supply to the factory and reduced by a bank of transformers to the voltage necessary for the heaters.

The heaters in the general office were connected to a unit control with thermostatic regulator and the heaters in the private offices were controlled by local switches. The size of this building is approximately 40 x 60 feet and two stories in height and the entire investment amounted to $2,200. During the coldest months of last winter this system was operating continuously at a total usage of 7,000 kw-hr. bought on the low block of power consumption at 7 mils. The standby charges for the connected load amounted to $20 per month on the basis of 50 cents per kilowatt connected. Therefore, the total cost per month is as follows:

7,000 kilowatt hours @ 7 mils,	$49
40 kilowatts @ 50c	20
Investment charge	20
	$89

It is very obvious that this cost is much less than even the wages of one man in attendance at the boiler room, leaving all other cost out of consideration.

Another similar instance that has proved of advantage was at a local steel plant where large quantities of electric energy are consumed and secured at a very low average rate and in which there is no other demand for steam other than that for office heating. In this case again the entire general office was heated electrically with a maximum cleanliness and convenience and at a minimum cost.

Western Dealer, Jobber and Agent

Business building suggestions for the store — Distribution and warehousing methods — Advertising and sales promotion ideas

A Retail Location for the Farm Light Dealer

The Experience of a Denver Dealer in Merchandising Small Plants Indicates That Location Has Much to Do with Sales

By JOHN T. BARTLETT

Due, doubtless, to the field served—most buyers are rural buyers—farm light and power dealers have a way of getting out of the retail district for a business location in towns and cities of size. In a city of Denver's size they are likely to get down in that part of the town where wholesale houses and manufacturers' agencies congregate. Rentals here are much lower. There seems no particular loss, in the fact that passing traffic is light, and probably is so negligible that windows displays will get no special thought.

The experience of a Denver farm light and power plant dealer, however, indicates that a location can be picked which will be much better than such a one. The Lalley-Whitmore Electric Company has a location which has, directly and indirectly, led to a sufficient number of sales to have conclusively demonstrated its desirability. This location is on Court Place, in downtown Denver.

This location is in the retail district. It is also in the hotel district. Just around the corner is the leading hotel of the city. Many other hotels are within a short distance. At these hotels a great many visitors to the city from New Mexico, Wyoming and other parts of Colorado put up, and going to and from the hotels they pass the Lalley-Whitmore store.

A few days ago one such visitor had instructions from a friend to buy a battery when in Denver. A certain company which had sold this user in the past would, in the natural order of events, have received the order. However, the friend happened to pass the Lalley-Whitmore store. Obeying the instincts of the careful buyer, he stepped in to ask the store's price and get other information.

He ended by buying of Lalley-Whitmore, whereas he had fully expected to buy of another dealer. Moreover, the company was in an excellent position to get future business in supplies of this user.

On another occasion an out-of-town man dropped in, remarking that he didn't "intend to buy just now," but since he was passing, decided he might as well come in and get information about the plant the company sold, which he had heard was a good one. Before this man had paid his hotel bill and departed from Denver, the company had sold him a plant.

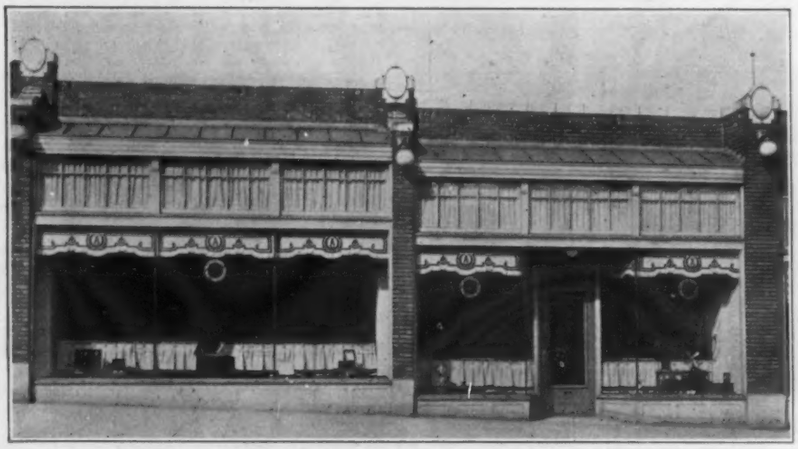
Mr. Whitmore is so sold on the value to the business of the windows that he terminated recently an arrangement he had formerly had, whereby one of the windows, and half the space within, was rented to another man for $50 a month. In the sub-renting proposition the company had been interested as a cost-reducing method.

A great deal of traffic passes the store from the Capitol Hill, high-class residential district. This fact is responsible for an occasional sale. Many Capitol Hill residents own country estates, and their buying power has held up a great deal better, it goes without saying, than the farmer's buying power. These people also own summer camps in the mountains.

The Lalley-Whitmore company went after this business just prior to the opening of the fishing and outdoor season, and thereafter, with window displays featuring a special summer camp proposition. This was a plant sold without the battery at $195. The lack of the battery was not the disadvantage to the summer camp owner that it would be to the average all-the-year user. The price was much more likely to appeal as practical for a plant only used a part of the time.

The windows are changed every little while. Not only plants, but supplies are displayed. One display which aroused much attention was a miniature village lighted by a plant.

This business has given thorough tests to various forms of advertising—exhibits at fairs and stock shows, newspaper advertising, cars equipped with demonstrating apparatus, direct mail effort — and no advertising has more thoroughly and convincingly demonstrated its worth, on a basis of actual results compared with actual costs, than the window advertising directly resulting from its location in the retail and hotel district.



SEATTLE DEALER OPENS MODEL STORE

J. J. Agutter and Company, Seattle contractor-dealers, recently moved into this attractive new building on the edge of the most exclusive retail shopping district. The store, which specializes in electrical contracting and deals in all types of appliances, is featuring radio equipment at the present time. The company is headed by J. J. Agutter, president of the Seattle Electrical Association.

June Bride Week Results in Both Publicity and Improved Sales

Results from the recent June Bride's Week, conducted throughout California under the auspices of the California Electrical Cooperative Campaign, indicate that the campaign was most successful in moving merchandise from the dealers' shelves during what would otherwise be a slack summer period. An incomplete check of newspaper space devoted to this campaign shows the publicity value of the undertaking. The figures are: in the southern part of the state, 560 inches of publicity and 2146 inches of display advertising; in northern California, 819 inches of publicity and 1154.5 inches of display advertising. So great was the interest evinced in the Radio Wedding, that the New York Times telephoned for full details and a photograph of the bride and groom. In checking up the sales effect of the week it must be remembered that the Jobber will probably not feel the effects of the increased sale until somewhat later. Dealers throughout the state, however, report considerable stimulus to sales. Many of them were enabled to move stock which was left over from Christmas.

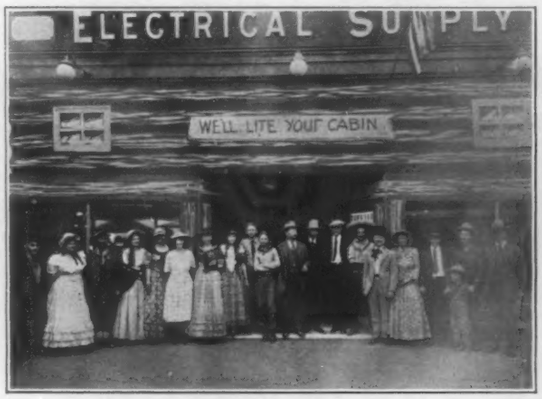
Early California History Depicted at Sacramento

Electrical Industry Takes Prominent Role in Days of '49 Celebration at California Capital. Whiskers, Costumes, Hoopskirts and Unique Window Displays Features of Fete

The attractive window display of the Electrical Supply Company during '49 week in Sacramento always had a crowd of people around it. It was a faithful reproduction of a miners' camp.

Three attractive young ladies arrayed in the decorative styles of an earlier day were a few of the shining lights of "The Light House," which was the local headquarters of the Great Western Power Co.

The faces above, distinguished principally by the variety and luxuriance of the whiskers, are not part of a rogues' gallery of early-day western desperadoes. Shorn of the disguise of sage brush the following would be revealed: (1) K. L. Engles, Great Western Power Company; (2) W. E. Dugdell, Sacramento Appliance Company; (3) P. Waxon, Waxon Brothers; (4) two pretty members of the Pacific Gas and Electric Company; (5) George Walters, Electrical Supply Company; (6) W. A. Weight, Sterling Electric Company; (7) E. W. Florence, Pacific Gas and Electric Company; (8) C. V. Schneider, Electrical Supply Company; (9) J. C. Hobrecht, J. C. Hobrecht Company; (10) R. J. Finchley, J. A. Warren, J. A. Woods, W. H. Slickman, Miss Phelps and Mrs. Lanning of the California Mechanical and Electrical Engineering Company; (11, a close up of Mr. Woods; (12) part of the hard-boiled looking staff of J. C. Hobrecht.



C. V. Schneider, of the Electrical Supply Company, is surrounded by what seems to be stage-robbers, prospectors, gamblers and fair ladies, who are all members of his staff arrayed for the occasion.

Members of the staff of the Sacramento Appliance Company, with W. E. Dugdell in the center, are shown displaying one of the many "new fangled inventions" described in the sign above them.

Honesty, Ethics and the Electrical Contractor

A Frank Discussion of the "Curbstoner," the Circumstances Which Created Him, and the Possible Means of Elevating Him

by J. E. BULLARD

The union leaders called a strike. John Jones was a good union man so naturally he went out on this strike. But Jones had a wife and four children to support, and though he was a good workman, had always had employment except during strike and had earned good wages, he had very little saved up. The allowance from the union would not support the family. It looked as though the strike would be a long one, and if it was, his small savings added to the union allowance would not keep him going.

One day he heard of a man who wanted a job of wiring done. It was a job that ought to be done right away, but the strike had tied up the regular contractors to such an extent that none of them were in a position to take it. Jones saw no reason why he couldn't do the work himself. He made an attempt to secure the contract and did so.

He thought he had figured high enough so that he could do a first-class job and make a profit. As he went on with the work, however, he found it was going to cost more than he expected that it would.

The material he was getting he was buying through a contractor, who was supplying several other men in the same way. This contractor considered this a good way to make a little profit while the business was tied up. Anything the men could not handle themselves about the jobs and he could, he did, though supposedly each man was doing the work for himself.

Jones confided in him one day that he was not going to come out even on that job if he reckoned in his regular wages, and between them they figured out what could be left out and still have the work pass inspection and serve the purchaser for a time. In the end the job was completed at a cost that showed Jones a fair wage.

He took other jobs and in each case tried to figure them accurately, but there always seemed to be something that he had left out, and it became necessary to skimp the work in order to make a little money. At first he didn't like to do it. In fact, he would not have done it for he prided himself in his work, but the kids at home needed a new pair of shoes, the wife had to have a new dress or there was one thing or another money was needed for, and he simply had to make those jobs pay.

The more jobs he took and the more he skimped them, the easier it seemed. He was making a little money. Not much more than day wages to be sure. In fact, not as much as day wages if he figured in the time he spent Sundays, Saturday afternoons and evenings, figuring estimates, collecting money, and scheming out ways and means of saving money on each job by leaving out something that ought to be in it, but would pass inspection if left out.

Accordingly, when the strike ended he decided to remain in business for himself. He increased his business and hired a few men. As the years went by he increased his business still more. He has been making a little money right along and perhaps is a little better off than he would have been had he remained a wage-earner. But he is not in good standing.

Now there are a lot of Joneses in the contracting business. Like this one, they are not doing a strictly honest business. They are a serious obstacle to those men who want to raise the business to a higher plane. Their number is increasing every year.

It is well to go back and see just why Jones has gone on all these years doing business as he has. When he started he was a good workman. In fact, the first job he took for himself he intended to make a good job. But he simply had to get out of it whole, so he had to get out of it any way that he could. Since he has learned that it doesn't matter so much what price is quoted as it does how much can be saved on the job, and he has gone right along on this basis.

Had Jones known anything at all about business he would have figured that first job higher. He could have gotten any reasonable price for it, because it simply had to be done. If he had known what it was going to cost he would have asked a price that would have covered the very best job he could do and still left a profit. Then he could have pointed with pride to this first job and secured others on the strength of it. Instead, he has been getting all his business on a price basis. He secures no work where quality is the first consideration.

His method of doing business has made him suspicious and he does not take much stock in the meetings of the local association. He figures that it is just a scheme to get the best of him.

And right here we get down to the real reason why Jones is not doing business on a more honest basis than he does. He doesn't know how. The only actual business training that he has had he got from that unscrupulous contractor who was encouraging the strikers to go in business for themselves in order that he could make a profit on the supplies and material that he sold them. He knew that no jobber in town would open an account with them and this gave him a chance to make a real profit out of them.

If the business education of Jones had not been neglected he never would be the sort of business man he is today. By nature he was honest, but he needed money, knew nothing about business and thought after the first few jobs that he was developing into a good business man.

By the time he did really become a contractor his mind was poisoned to such an extent that he was an almost hopeless case.

What Jones did not understand, and what a lot of contractors that started in business with no more business training than Jones do not understand, is that even though the business is merely a one man affair, that man getting the business, doing the work and everything else, there are certain things that must be done and considered if a real profit is to be made. Jones, for example, did not stop to consider that he had to spend part of his time as a sort of general manager of his little business. He did most of this work outside of regular working hours, and to this day does not figure it into the cost of a job as he should.

He had to spend part of his time keeping books, but those books were very crude, did not require much time, and he overlooked this cost. When it came to satisfactory financial relations, he never has had any. He does not know enough about his business to make up an accurate statement of his business and he would have a very hard time borrowing money from the bank unless he could get a friend to sign his note.

He still thinks that he has practically no overhead. Hasn't he already proved that? He has been able to do business without giving overhead serious consideration.

The only time that Jones could have been taught the fundamentals of business was when he was still working for wages. It is doubtful if he would ever have tried to go into business for himself if he had been given a little better business education. It is certain that he would have been a much better business man if, after having received this education, he had gone into business.

Few men are dishonest because they want to be. Some are dishonest because they do not know any better. Some are dishonest as a result of circumstances. Some do not even know that they are dishonest.

Any man who bases his estimates on the prices that others quote and then tries to make money on the job is not strictly honest. At the same time he may consider himself so. He considers himself so because this may be the only way that he knows of arriving at a fair price.

Just so long as men with no business training and no business education are allowed to become full-fledged contractors, the code of ethics used as a standard by the average contractor cannot be as high as it should be and must be if the contractor is to take the place in the community he is entitled to take. Some way must be found to educate a man before he starts in business for himself. Leaving this education until after he is started is delaying it too long.

The desired result may be accomplished by holding educational classes for all the workmen. It may be accomplished by having laws passed that require a certain amount of business as well as electrical training before a man is licensed as a contractor. It may be accomplished in any one or a combination of other ways. The big thing is a realization that it is much better in the end to see to it that a man is just as good a business man as he can be made before he starts—at least that he is going to do an honest business—than it is to try to make him a good business man and an honest contractor after he has been taught and has tried other ways. It is more satisfactory to keep him innocent than to try to reform him.

Activities of the West

A Business Man's Department Devoted to Events and Developments in Western Industrial Centers—Including News of Interest to Readers in Public Utility, Industrial and Trade Fields

Uniform Accounting Adopted by Idaho Utilities Commission

The public utilities commission of Idaho has issued an order, dated June 27, adopting the uniform system of accounts prepared and recommended for adoption by the state commissions at the nual meeting of the National Association of Railway and Utility commissioners at Washington, November 12, 1920. The order is known as general order No. 29 and supersedes the system of accounting for electrical utilities provided for in general order No. 7 of the commission, dated October 27, 1913.

All electrical utilities operating in the state of Idaho are obliged to use the new system after January 1, 1923, and all reports to the commission after that date will have to be made in accordance with the requirements laid down in the system.

The order of the commission states that the system is adopted as it now stands, but that a further hearing will be held October 15, 1922, to consider amendments, if there be any at that time.

Several other western states have adopted the system, which was recommended by the national association because of the many electrical utilities doing business in more than one state, and being required to conform to the method of keeping and reporting accounts used in each of the respective states.

California Railroads Lose Protest Against King Tax Bill

A petition of the Southern Pacific and Atchison, Topeka and Santa Fe Railroad companies for an injunction to prevent the State from collecting increased taxes under the King tax bill was denied by the United States District Court. It was stipulated, however, that the difference between the tax specified in the King bill and the tax formerly paid should be impounded until such time as the State Supreme Court passes on the legality of the King measure.

The railroads had claimed that the King bill which readjusted corporation taxes, demanded an unfair return. The State's side of the case was represented by Attorney General Webb.

The members' forum of the Portland Chamber of Commerce, by a vote of about 3 to 2 has expressed itself in favor of the Daylight Saving Plan. The city of Portland, however, after taking the matter under advisement and obtaining an expression of opinion from the people of the city, decided unanimously against the plan, and the matter is officially dead as far as this community is concerned.

Compromise Offered in Denver Gas Rebate Case by Company

Under the terms of a compromise offered by the Denver Gas and Electric Company in the gas rebate dispute which has been in the court for some years, the city would receive $700,000 in full payment and the gas company would be under obligation to spend $2,000,000 for improvements.

Since 1918 the city has been trying to enforce one section of the company franchise granted in 1906, through which the city was to collect all money in excess of 75 cents a thousand cubic feet of gas. These charges, during the past four years, have resulted in claims aggregating a little less than $1,000,000. Bills which the city has refused to pay the gas company total close to $300,000. In its claims the city demands payment of $960,000.

Although no action has been taken in regard to the proposal at a late date, it is understood that the plan is acceptable to the city.

NIGHT CONSTRUCTION ON HETCH HETCHY
Work on the Hetch Hetchy water and power project of the city of San Francisco is being pushed forward with night and day shifts. The lamps shown are 1000-watt Mazda in RLM reflectors suspended from messenger wire strung across the gorge.

Don Pedro Power Not to be Sold Wholesale to Power Company

Voters of Modesto and Turlock irrigation districts, by a vote of almost 3 to 1, rejected a projosal of the Pacific Gas and Electric Company to purchase the electric energy developed at San Pedro dam. The voters also voted to distribute the power of the dam themselves and to issue bonds in the sum of $1,000,000 to erect power plants, pole lines and transformer stations.

Water Rate Reductions on Steel Feature of Rate War

An early end to the intercostal rate war recently inaugurated by the withdrawal of two of the Pacific steamship lines from the joint conference, is seen in the continued downward trend of rates, which cannot long be maintained.

The Pacific Mail and the American-Hawaiian Steamship Company have announced increased service, the former more than doubling its cargo capacity by the addition of four 10,000 ton passenger and freight vessels and the latter announcing a weekly instead of fortnightly sailings from Philadelphia.

The Pacific Mail will maintain sailings from New York for Pacific ports every ten days for freight and every seventeen days for passengers under the new schedule.

Several new reductions were announced including the rates on steel products, which were quoted at 45 cents per hundred pounds instead of 60 cents, the old price; furniture $1 instead of $1.80 and canned goods 50 cents instead of 75.

Local shippers, it was reported, are demanding that intercostal lines give them a guarantee on prevailing rates for the season, but this has been refused so far by the operators. Freight bookings, as a result, have dropped considerably, especially in dried fruit and canned goods.

Utah Commission Denies Special Rate For Electric Furnace

The Public Utilities Commission of Utah has entered a decision denying the application of the American Foundry & Machine company for a special rate, based on power consumption only, with which to operate its electric furnace. The application was filed about three years ago. This case has been held pending decisions in the special contract case and the application of the Utah Power & Light company for an increase in its regular power schedules, which cases were decided some time ago.

The foundry company alleged that it could not afford to pay the regular schedule rates, particularly the demand charge, for power. The commission, however, argues that if it were to take into consideration the ability to pay of a single customer it would end in every customer having a different rate, and all uniformity of rate structure would be destroyed with illegal discrimination the result. "Rates," it says, "must be based upon cost of service," which was the consideration kept in mind by the commission in fixing the present power rate schedule of the Utah Power & Light company.

Events in Washington of Interest to Western Men

A Survey of Recent Developments in the Nation's Capital by Paul Wooton, Special Correspondent of the Journal of Electricity and Western Industry

While the Swing bill, providing for flood control in the lower Colorado River basin and for the utilization of the water for irrigation and power purposes, probably will be amended in many particulars, it seems probable that the Committee on Irrigation of the House will recommend the passage of the measure. The recess which the House has taken has interrupted the hearings on the bill but the hearings will be continued immediately on the reassembling of the House in August.

While the greatest pressure for this legislation is coming from those who need protection against floods,—irrigation, power and mining interests are contributing importantly to the influence being brought to bear upon Congress. The mining industry is particularly insistent. The highly mineralized territory which could be furnished with power if the Boulder Canyon dam was built, is suffering because of the almost prohibitive expense of generating steam for power purposes and by the high cost of living due to the limited area which can be used for agricultural purposes without cheap power to pump water. As a result the mining interests are very actively urging the development. The acting director of the Bureau of Mines, in a letter to the Committee on Irrigation, not only urged the development so as to stimulate the production of minerals, but to develop Arizona to the point where it would be possible to continue the railroad from Ajo to the Gulf of California, thereby giving an outlet to tidewater for the products of a region whose nearest port is San Diego on the West and Galveston on the East.

The mining interests also are urging action by the Federal Power Commission on the water power application of James B. Girand. His application covers the development of power at Diamond Creek on the Colorado River. The matter was discussed at the last meeting of the Federal Power Commission. It was decided to extend Mr. Girand's preliminary permit until November 30, but the Commission declined to depart from its policy of issuing no licenses on the Colorado until a policy covering the River as a whole has been evolved.

Some are urging that there is no real necessity for constructing the Boulder Canyon dam to a height of 700 feet at this time. Some contend that a dam 300 feet high would be adequate to furnish all the storage that will be necessary for many years to come to supply all requirements for power and irrigation, and at the same time would provide flood protection. Representative Swing, the author of the bill, contends, however, that it would be much better business to construct the dam to the full height at the start.

Trunk Highway Construction

To stimulate the construction of important trunk line highways through the thinly settled regions of the public land states, special provision has been made so that the Federal Government may participate in such construction to the extent of 50 per cent plus a percentage ratio of the total estimated cost equal to one-half of the percentage which the area of the public land bears to the total area of the state. The maximum Federal aid of $16,500 per mile is increased by a like percentage. The amount per mile and the percentage of the total cost that can be paid from this year's $50,000,000 appropriation is shown by the following (the percentage payable by the United States and the maximum Federal aid payment per mile, are given): Arizona, 61.11 per cent, $20,167.20; California, 59.31 per cent, $19,575.49; Colorado, 56.12 per cent, $18,521.43; Idaho, 58.01 per cent, $19,144.97; Montana, 53.04 per cent, $17,503.23; Nevada, 87.22 per cent, $28,784.51; New Mexico, 61.50 per cent, $20,237.58; Oregon, 61.13 per cent, $20,175.12; Utah, 78.85 per cent, $24,-701.89; Wyoming, 64.65 per cent, $21,-335.83.

Expiration of Pittman Act

As only little more than a year will be required to replace the treasury reserve of silver, sold under the Pittman Act, active negotiations are in progress looking to the formation of a silver export association. While it may not be possible to maintain the price of silver at $1 an ounce, as is provided in the Pittman Act, it is believed much can be accomplished by providing for the orderly marketing of the production of the United States and Mexico. These two countries furnish 40 per cent of the world's silver. Most of the Mexican production is marketed through American agencies. By the formation of an export association along the lines of that conducted by the copper producers, it is believed that the demoralization of the American silver producing industry, which is threatened by the expiration of the Pittman Act, can be prevented.

Bishop Creek Development

The Nevada-California Power Company, of Riverside, California, has applied to the Federal Power Commission for a preliminary permit covering a power project which involves the construction of four storage reservoirs on the headquarters of Bishop Creek in Inyo County, California. The water is to be utilized in four existing plants on Bishop Creek. The Colorado Power Company, of Denver, has applied for a license covering the following transmission lines: Saguache extension from the Cocomonga distribution line to Saguache, 14.16 miles; Eagle extension, Bonanza to Eagle mine, 3.29 miles; Express extension, Bonanza to Express mine, 1.69; Queen City extension, Bonanza to Queen City mines, 1.84 miles.

Sacramento Flood Work

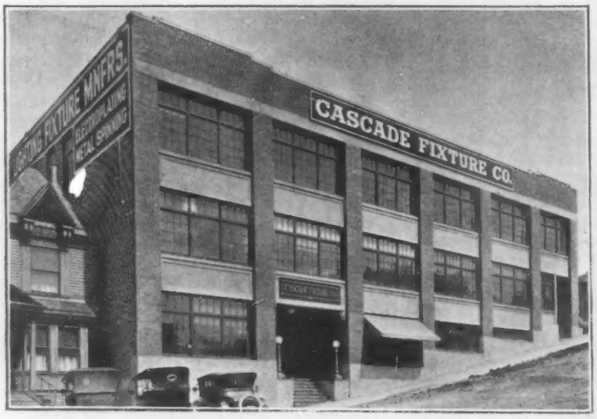
Early action is expected by the Senate on the bill authorizing the California Debris Commission to reimburse the City of Sacramento for the $161,-557.08, which it expended in the construction of a weir, a part of the flood control plan on the Sacramento River. To relieve the city of a flood menace, Sacramento advanced this money at a time when Federal funds were not available for the work. The Senate committee has endorsed the bill in exactly the same language approved by the House, thereby making possible its passage without the delay of a conference between the two Houses.

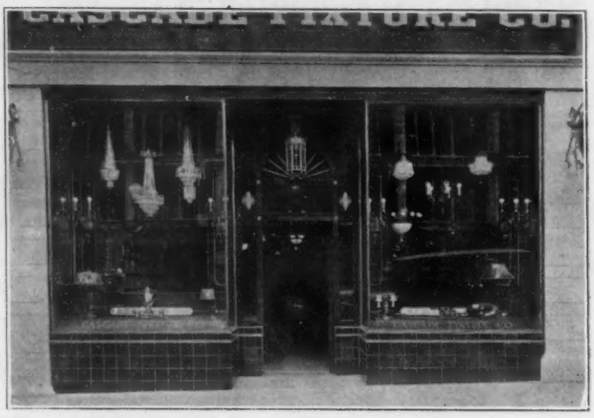
Colorado River Commission Will Meet August First

Word has been received by various western members of the Colorado River Commission that that body will hold its next meeting on Tuesday, August 1, at some place in New Mexico to be designated by the governor of that state. The meeting will probably be held in Santa Fe.

The commission is expected at this meeting to proceed with the formulation of some sort of plan for the distribution among the states of the Colorado river basin of the waters of the river. This plan will then be presented to the various states for ratification. The plan will be prepared in the light of such information as was gathered at a series of meetings held by the commission throughout the basin this spring.

Two of five 300-hp. 440-volt 3-phase motors for the Big Creek development of the Southern California Edison Company. Each motor weighs over 5 tons and the entire shipment weighed 122,000 pounds and required three cars. The motors were sold by the C. W. King Company of San Francisco. They were formerly in the Akron plant of the Goodrich Tire and Rubber Company and were brought to the Pacific Coast and reconditioned. Before shipment each car was covered with heavy canvas to protect the machines from dampness.





CASCADE FIXTURE COMPANY MOVES TO NEW QUARTERS IN SEATTLE

The Cascade Fixture Company, formerly located at 1517 2nd Avenue, Seattle, recently moved to new sales quarters at 418 Union Street, pictured above. H. E. Gleason is president and manager. This concern was originally called the Cascade Gas & Electric Fixture Company; later this name was changed to the H. E. Gleason Company, and still later to the Cascade Fixture Company. The company has been in business in Seattle for 17 years. The showroom herewith reproduced, handles electrical fixtures, manufactured by the company in its own plant at 1710 Yale Avenue, also pictured above. The Yale Avenue manufacturing plant employs 54 people, and operates continuously, serving customers in the Pacific Northwest, California, Alaska and the Orient.

Call Issued for Fall Conference of Electric Cooperative Leagues

The Society for Electrical Development has authorized the issuance of a call for a conference of representatives of local cooperative leagues. Invitations will also be extended to cities and localities contemplating the formation of such a local association.

The definite time and place of this conference will be later determined, but will probably be held during either September or October, after a canvass of the situation indicates how many will attend.

The prime purpose is to create an opportunity for the exchange of ideas and experiences which may assist in more effectively carrying forward local activities, by a more intimate knowledge of practices maintaining in all sections of the country, and also to formulate plans for the future continual exchange of information in a practicable and workable form.

Although the advisability of the Society financing such a meeting was considered, the opinion prevailed that representatives of such local associations would feel more free to present their thoughts and discuss mutually interesting problems if they were present at the expense of their local organization. The Society will assume certain expenses of a general nature, and such expenses have already been authorized by the Executive Committee.

Fallen Timber to be Salvaged by Sale of Government Railroad

Sale of the government's spruce railroad, running into the heart of the Olympics on the Olympic Peninsula, from a point near Port Angeles, has been consumated, the purchasers being Fentress Hill, F. S. Scritsmeier and J. F. Lyon of Portland, and the price placed at $1,000,000. The sale includes the big government sawmill and hotel at Port Angeles, considerable timber in Clallam County and all of the machinery of the government's dismantled spruce cut-up mill at Vancouver, Wash. A clause in the contract of purchase requires the purchasers to expend in the rehabilitation of the properties at least $200,000 within one year. The Clallam county railroad railroad is about 36 miles long, running through heavily timbered country all the way, and was constructed during the war. It is in this timber belt that such heavy damage was done by the windstorm in January, 1921. Dispatches from Washington state that the purchasers of the line are willing to operate the railroad as a common carrier, which will permit private owners in the district to salvage considerable of the down timber that was felled during the great storm. Sale of the spruce railroad, with the consequent development, is expected to give a big stimulus to lumbering operations in Clallam county.

Pacific Power and Light Co. Starts Construction on Hood River

Construction work has been started on the new $1,250,000 power plant of the Pacific Power and Light Company on Hood River. Two hundred and fifty men have been placed at work and 550 more are to be added. Two permanent camps have been established, one at Powderdale and another three miles up the river, where the dam and headworks will be built. The Phoenix Utility Company is in charge of construction. J. E. Shinn is superintendent.

Permission for Consolidation of the Reno Power, Light and Water Company and the Truckee River General Electric Company under the name of the latter concern has been granted by the Nevada Public Service Commission.

The million-dollar factory of the newly organized Durant Motor Company at Oakland, California, for the manufacture of a new motor car is expected to be ready to begin operations within the next sixty days. The plant has 300,000 sq. ft. of floor space and a capacity of 50,000 motor cars a year. It will furnish employment for approximately 1,000 men. The factory was built by the P. J. Walker Construction Company.

Seattle Faces Problem in Recent Street Railway Tax Decision

The City of Seattle will be responsible for three fourths of the 1919 tax bill on street car lines and the Puget Sound Power and Light Company for one fourth, if the recent decision of the supreme court of Washington is enforced. The sum involved is $401,017 and the debt bears interest from the date of March, 1920.

The tax in question was levied by the state tax commissioner in 1919. The city and the company claimed the property was not subject to taxation for the year 1919 because the city acquired title March 31, 1919, and the state tax commissioner had no authority to make an assessment prior to April 1, 1919.

The city is in some difficulty in the matter, owing to the fact that no money is available from the city railway fund, the railways under city management having shown a deficit to date. According to a previous decision of the Supreme Court, recourse cannot be had to the general fund. It is understood that a plea for leniency will be made to the county commissioners.

The Puget Sound Company, on the other hand, announces its intention of paying the taxes under protest and of later carrying the matter to the Supreme Court of the United States.

Seven electric yarders and loaders recently installed by the Hutchinson Lumber Company, of Oroville, California represent the first electrically driven machines of this type to be put in operation in California and the second in the industry. They are used to replace the ordinary donkey engine of the lumber industry in dragging in logs and loading them on cars, etc. The total motor capacity is 475 horsepower, and power is supplied through local power lines. The machines are constructed by the General Electric Company and installed under the direction of their engineers.

Cooperative League Extends Activities in Colorado

According to reports from Denver, the Electrical Cooperative League of that city, which has just completed its first year of operation, is planning on extending its organization and activities throughout the state of Colorado.

A committee headed by John J. Cooper, general manager of the Mountain Electric Company, has been working on the development scheme for several weeks and it is understood that intensive development of the territory will be started immediately in accordance with the committee's report.

Extreme satisfaction with the first year's program, developed under the direction of S. W. Bishop, executive manager, has been maintained and the interest held in the movement is evidenced by the renewed support of the Denver jobbers, contractor-dealers and central station, and a large representation of the manufacturing interests.

The program of the activities for the second fiscal year has not been definitely established but it is known to include development of the electrical home idea in at least four Colorado cities. An industrial lighting exhibit, accompanied by a lecture course in improved illumination, is planned. The "electrify" movement in the Rocky Mountain region proper will be coordinated from the Denver headquarters of the League.

Wenatchee District to be Served by New 110,000-v. Line

The Puget Sound Power and Light Company, with head offices in Seattle, has begun construction of a 110,000-volt transmission line from one of its hydroelectric plants in the Puget Sound district to Wenatchee in Central Washington. The line will be 120 miles long, and will cost, with transforming and switching equipment, approximately $800,000. It will deliver 30,000 horsepower of electric energy to existing local companies and power users, and will supply the general power needs of that section of central Washington. No new power plants will be required to furnish this large additional service, as the company has ample power plant capacity for all present and immediate future needs. The line will be built up Green River Gorge, following the Northern Pacific Railway, and passing through Easton, Cle Elum and other town in the upper Yakima Valley. S. L. Shuffleton, chief hydroelectric engineer, will have charge of construction.

A thirty-five year contract has been made with the Washington Coast Utilities Company, operating the Wenatchee properties, for their entire requirements for power supply, and the new line of the Puget Sound Power & Light Company will give an added impetus to the entire region, of which Wenatchee is the geographic and commercial center.

The Milwaukee electrification connects the transmission systems of the Puget Sound Power & Light Company and the Washington Water Power Company. The new Wenatchee line will make another interconnection possible if it is needed at some future time.

Seattle Surplus Power to be Sold to Industries at Low Rate

By an ordinance passed by the city council of Seattle, surplus power of the municipal light plant will be sold to manufacturers at a reduced rate. The bill provides for the sale of electric current produced over the regular demand, and which would otherwise go to waste, at $1.12 a k.w. per calendar month. There is said to be a surplus of about 5,000,000 kilowatts per month during the high water season at Cedar Falls. Contracts under the above rate would be limited to five years.

Peru Exempts Materials for Public Utility Construction Work

In order to facilitate the extensive improvements planned by the Empresas Electricas Asociadas (Association of Electrical Companies) in the development of electric light, power, and traction services, the President of Peru has signed a law modifying their franchise and granting certain concessions, the most important being the following:

The period of time for the improvement of the electric railways from Lima to Callao and from Lima to Chorrilos is extended to 20 years. All material necessary for the construction and improvement of the installations of light, traction, and power will be exempt from import duty for a period of five years. Among the materials benefited by this reduction are: Ties, rails, locomotives, tanks, railway coaches, and various cars, nails, screws, hinges, telegraph wire and posts, and all other apparatus, and material which the Government may deem necessary for the construction work and new installations. The company shall also be exempt during the entire period of concession from any new municipal, Federal, or corporation taxes or charges that may be created during that time, and from any increase in the present taxes which may directly affect its income from the exploitation of the electric lighting and other improvements. This exemption does not apply to the profits which the company obtains from the exercise of its functions.

Governor Louis F. Hart of Washington has announced his intention of calling a conference of the governors of eleven western states in the near future for the purpose of considering problems of taxation. He is preparing to issue invitations to the chief executives of Oregon, California, Nevada, Utah, Arizona, New Mexico, Colorado, Wyoming, Montana and Idaho to meet at Sacramento, California, at a date to be announced later.

Utah Has Vast Hydroelectric Resources, Expert Avers

In a talk before the Kiwanis club at Salt Lake City recently, R. R. Woolley, hydraulic engineer of the United States geological department, stated that water power sites in Utah are capable of developing 1,800,000 horsepower. This estimate embraces sites on the Bear, Provo, Green rivers and other surrounding mountain streams. Approximately 200,000 horsepower is developed by the forty-six plants in operation, he said. All of the undeveloped sites are under government control. Mr. Woolley suggested a pumping station near the point where the Bear river enters Great Salt Lake. It would be possible to irrigate about 30,000 acres with this water which is less than one per cent salt as compared with the water on the opposite side of the Lucin cut-off at 20 per cent salt. A pumping station in the Provo River valley, he said, where lands are now waterlogged from the high spring freshets would water between 30,000 and 40,000 acres of land in Tooele county.

At the Great Northern Division offices in Everett, Wash., it is announced that freight yards in Bullington will be enlarged with an estimated cost of $100,000. More than a mile of new track will be laid. Increasing freight business is given as the reason for the improvement.

Los Angeles Shipping Firm Gets Contract for Reconditioning

Contracts to the amount of $200,000 for the reconditioning of the liners, City of Los Angeles and City of Honolulu, were recently awarded to the Los Angeles Shipbuilding and Drydock Corporation. Other work under way by this firm includes the construction of two double ended steel ferry boats for the Key Route system of San Francisco, the building of steel lumber schooners and the erection of a large lumber plant resulting from the combination recently announced between the Shipping Corporation and a British Columbia timber company.

FIRST UNIT OF SAN FRANCISCO PLANT OF MAJESTIC ELECTRIC DEVELOPMENT CO. New main office and factory of the Majestic Electric Development Company on Folsom St., San Francisco. The new factory which has been occupied since the first of May is more than four times the size of the previous quarters of the plant, occupying 125 front feet on Folsom Street, and extending through the block, of part two and part three-story construction. Even during the period of construction, the business of the company has grown, and it expected that within the next two years the quarters will be extended to cover the end of the block, as well as have additional stories added. Several new heating devices, among them a large household water heater and a new type of waffle iron have recently been placed on the market by this company, which is one of the few large concerns who have their headquarters and main factory on the Pacific Coast, with branches throughout the East.

Survey of Power Possibilities of Green River Under Way

For the purpose of determining power and reservoir site possibilities, a complete topographic survey of the Green river from Green River, Wyo., to Green River, Utah, is being undertaken. The work will taken between three and four months, and will be the first attempt to complete an actual survey.

The 300-mile river trip and a seventy-mile side trip down the Yampa river will be made in three specially constructed boats. Nine feasible dam sites, capable of an approximate production of 1,500,000 horsepower, will be investigated.

Most of the trip will be made between canyon walls of from 2,000 to 3,000 ft. A series of rapids and a number of waterfalls will occasion much portage. Canyons to be passed through are known as the Flaming Gorge, Whirlpool canyon, Red canyon, Swallow canyon, Lodore canyon, Split Mountain canyon, Desolation canyon and Gray canyon.

Boats to be used were designed by Colb brothers of Kanab, Utah. Both ends of the boats are watertight compartments, with a cockpit in the center of each boat.

The personnel of the party includes Ralf R. Woolley, hydraulic engineer of the United States geological survey; K. W. Trimble, chief topographer; two experienced boatmen who will act as rodmen, and expert boatman, a geologist, a cook, and H. L. Stoner, representing the Utah Power and Light company.

Second Electrical Home for Salt Lake City Planned for July

July 15th will mark the opening of Salt Lake City's second Electrical Home. While this display will not be as comprehensive as that of the first one, it is expected from a commercial standpoint that it will be of far more value to the electric industry locally on account of its great appeal to the majority of home builders—in that it is something which could easily be applied to any residence of moderate cost.

Over 38,000 announcement slips extending an invitation to the public of Salt Lake to visit the Home are being distributed through various channels and an active campaign is about to be started which it is hoped, will draw a record attendance of visitors.

Weather Change Improves Northwest Forest Fire Situation

Forest fire conditions which have been troublesome in the Pacific Northwest owing to an unusual dry period, are reported better, following general light rains and fogs during the first two weeks of July. Fires have been active in Tillamook county, Columbia county, Oregon and the Lake Chelan district and much damage has been threatened but it is hoped that this menace is now averted. Near Newhalem, the site of the Skagit river project of the city of Seattle, a destructive fire is reported to have destroyed three miles of railroad built beyond the power plant for carrying supplies to the dam and tunnels.

Proposed Bridge Over Carquinez Straits Protested at Hearing

The proposed bridge across Carquinez Straits for which an application for a permit was sought by the San Francisco Transit Company, has been taken under advisement by Colonel Herbert Deakyne, who represented the War Department in the hearing recently conducted. Considerable opposition developed from transportation companies and others who claimed that their interests would suffer. The proposed bridge would extend from Dillon's Point to Eckley and would cost $2,500,000. It would be 3,000 ft. in length with a roadway thirty ft. wide, which would accommodate traffic from three highways.

The Central Mendocino Power Company has requested permission of the Railroad Commission to sell $200,000 of stock and to use the funds to construct storage and diversion dams, pipe lines, power house, transmission lines and distribution system for furnishing power to the city and valley of Willits.

Constitutionality of the act providing for a levy of one mill tax by the general fund of the city, to create a guarantee fund for the benefit of the salability of special improvement district bonds, is upheld in a recent decision of the Utah Supreme Court. E. B. Wicks of Salt Lake City objected to the sale of bonds covering Lighting District No. 6, on State street, on the ground that the city had no right to use the general fund of the city to guarantee payment.

New Radio Company Erecting Factory in Salt Lake City

Nathaniel Baldwin, inventor of the famous Baldwin radio receiver and amplifier, has incorporated a new million-dollar company to be known as Nathaniel Baldwin, Incorporated, for the manufacture of radio apparatus. Associated with Mr. Baldwin in the company are David Neff, vice-president and treasurer; Lawrence Clayton, secretary; Seth Chamberlain, Ray Andrus, J. P. Fisher and Loren Wooley.

It is understood that while Nathaniel Baldwin, Incorporated will have full power to manufacture the apparatus and to grant licenses for the manufacture of apparatus under his patents, it is not now their intention to grant licenses other than that held by the Baldwin Radio company, a recently incorporated concern headed by David A. Smith, Lester D. Freed and Joseph F. Nibley, which is now erecting a modern factory for the making of parts in Holliday, a suburb of Salt Lake City.

The Utah Power and Light company has purchased the property of the Shelley Light and Power company of Shelley, Idaho, and will hereafter serve all territory formerly served by the Shelley company.

Alvadore Welch, of Portland, widely known promoter, financier and operator of public utility enterprises, has filed a petition of bankruptcy in the United States district court. Liabilities are listed at $387,399.47 against assets of slightly over $80,000. Although Welch's secured creditors hold claims aggregating $228,641.53, he lists the total value of his negotiable stocks and bonds at only $80,500.

The Weyerhauser Timber Company, Seattle and Everett, recently announced the gift to the state of Washington of 5,000 acres of cut-over land for reforestation purposes. The gift was made by George Long, northwest manager of the Weyerhauser properties. The Weyerhauser gift will undoubtedly be followed by similar announcements from other large timber companies. The object of the gift is to encourage reforestation. State authorities will make their selection of cut-over land, which they deem best for reforestation.

EDITORS OF CALIFORNIA VISIT THE PACIFIC GAS AND ELECTRIC DEVELOPMENT ON PIT RIVER

Sixty newspaper men were the guests of the Pacific Gas and Electric Company in an excursion to the Pit River development of the company over the Fourth of July. A group of the power men who acted as hosts is to be seen in the center picture. John A. Britton, vice-president and general manager of the company is seen at the end of the excursion train at the left and Wigginton E. Creed, president of the Pacific Gas and Electric Company, appears against a background of the cottages at Pit Camp No. 1 on the right. The excursion covered all construction work of the main power project and concluded with an inspection of Vaca substation.

Meetings of Interest to Western Men

A. I. E. E. Convention Plans for Vancouver, August 8-11, 1922

Announcement of preliminary plans for the Pacific Coast Convention of the A. I. E. E. at Vancouver, B. C., August 8-11, is made by the Vancouver Section. Besides the outings shown on the program, ample facilities are available for boat trips and other entertainment features immediately following convention.

PRELIMINARY PROGRAM, A. I. E. E. VANCOUVER CONVENTION

Tuesday, August 8—

Forenoon—Address of Welcome by His Honor Walter Cameron Nicholl, Lieutenant Governor of British Columbia.
Address by Pres. Wm. McClellan.
High Tension Transmission of Power, O. C. Merrill, R. J. C. Wood.

Afternoon—Sight-seeing trip, Stanley Park and Marine Drive.
Golf
Tennis
5 p. m. Tea for ladies.

Evening—Little Stories of Engineering, G. Faccioli.
Pictorial Symposium of Power Plant Comparisons, stereoptican.

Wednesday, August 9 —

Forenoon—An Overpotential Test for Insulators—G. W. Lapp.
Failure of Disc Insulators on High Tension Transmission Lines, Harrison D. Panton.
Tests and Investigations in Extra High Tension Insulators from a Purchasing Engineer's Point of view, C. C. Farr, H. E. R. Philpott.
Luncheon conference, Institute officers and Section representatives.

Afternoon—Conservation of Human Material, J. W. Upp.
Coordination of Professional Engineering and College Training, E. E. F. Creighton.
Training to Think vs. Gathering Information, T. Milton.
Golf
Tennis

Evening—Outing to Capilano Canyon.

Thursday, August 10—

Forenoon—Exciter Instability, R. E. Doherty.
Electrical Characteristics of Transmission Systems, H. B. Dwight.
Experimental Investigation on Wind Pressure Upon Overhead Electrical Conductors, Shungo Furui.
A Graphic Method for the Exact Solution of Transmission Lines, C. H. Holloday.
Luncheon, for all.

Afternoon—An Address on Steam Railway Electrification, A. H. Babcock.
An Address on Research—C. E. Skinner.
Golf
Tennis

Evening—Official convention dinner (informal)

Friday, August 11—

Forenoon—The Development of Telephotography, D. W. Isakson, L. J. Leishman
Recent Conclusions Pertaining to Electrical Precipitation Process, G. E. Horne
Electrical Precipitation of Solids From Smelter Gases, R. B. Rathbun.
Golf and Tennis finals.

Afternoon and Evening—Boat trip to Hydro-electric Plant of the British Columbia Electric Railway Company at Lake Buntzen. Boat will take party from Lake Buntzen to Wigwam Inn, Indian River for dinner, returning to Vancouver in the early evening.

1923 Ad Convention for Spokane

Spokane was selected as the 1923 meeting place for the Pacific Coast Advertising Clubs Association, which recently concluded a successful convention in San Diego. Officers for the new year are:

President, Thomas R. Keane, Spokane; Vice-presidents, for West Washington, John Condon of Tacoma, re-elected; for East Washington, Frank Beckman, Spokane; for Oregon, W. Kirkpatrick, Portland; for Northern California, R. A. Cleveland, Modesto; Southern California, Bert Butterworth, Los Angeles.

Salt Lake Dealers Reorganize

A reorganization of the Salt Lake Contractor-Dealers Association has recently taken place in an effort to stimulate renewed activity in that branch of the industry. The following officers are elected:

E. H. Eardley, president; G. R. Randall, vice-president; G. W. Forsberg, secretary, A. M. Sisam, treasurer; C. R. Dodge, fifth member Advisory Committee.

The new organization plans a weekly luncheon meeting at the Commercial Club, with speakers on interesting subjects, vital to the industry.

Plans for opening the intermountain development campaign, a movement to encourage patronizing home industries, on August 23, have been arranged by the Utah Manufacturers association. C. E. Arney of Seattle, who conducted a similar campaign in the Pacific Northwest, will arrive in Salt Lake early in August to take charge of campaign activities. The cooperation of civic clubs, schools and churches will be enlisted in the movement. The work will embrace not only Utah, but practically all states in the intermountain group.

Southern Idaho Convention Postponed

In order to accommodate speakers, the annual convention of the Southern Idaho Association of Electrical Contractor-Dealers, which was to have been held at Hailey, Idaho, on August 11-12 has been postponed until Aug. 25, 26, 1922. The entire southern portion of the state is represented in the membership of this organization and the convention committee reports that they are arranging an exceptionally good program.

Plans for the Pacific Northwest Merchants' Convention and Industrial Exhibit, to be held in Seattle July 24-29 are progressing rapidly and more than 35 per cent of the total exhibit space of 105,000 square feet has been contracted for by exhibitors. Tacoma and Seattle merchants are cooperating to stage the convention, and Tacoma will hold a convention of the Washington State Furniture Manufacturer's Association during the week.

The National Technical Section of the National Electric Light Association at its recent meeting at N. E. L. A. headquarters in New York determined upon the organization of the committee for the year. The principal recommendation adopted was that each local division organize committees comparable to those existing in the national section to the extent deemed necessary in that division. The chairman of each of these division committees will automatically become a member of the corresponding national committee.

It was resolved to hold three group meetings of the section during the ensuing year; the first, approximately in September at some middle west point, the second one approximately in November at a western or southwestern point, and the third in January in New York or other eastern point.

L. M. Klauber, San Diego Consolidated Gas and Electric Company, was appointed chairman of the national committee on Overhead Systems.

Laurence W. Davis, special representative of the National Association of Electrical Contractors and Dealers, together with **Kenneth A. McIntyre** of the Society For Electrical Development is to spend August and September in an extended western trip. Mr. Davis in his talks before the electrical industry will cover the subject of "Building the Business of the Electragists Through Association," while Mr. McIntyre will talk of the work of the Society under the subject, "Publicity by Cooperation." The itinerary as planned is as follows:

Dates in Cities	Cities
July 31 — Aug. 1-2	Winnepeg, Manitoba
Aug. 3-4-5	Regina, Saskatchewan
Aug. 8-9-10	Calgary, Alberta
Aug. 14-15	Vancouver, B. C.
Aug. 16-17	Victoria, B. C.
Aug. 18-19	Seattle, Wash.
Aug. 21	Tacoma, Wash
Aug. 22-23	Portland, Ore.
Aug. 25-26-27	Hailey, Idaho
Aug. 31—Sept. 1-2	Salt Lake City, Utah
Sept. 5-6-7-8	San Francisco, Cal.
Sept. 11	Fresno, Cal.
Sept. 12 to 16	Los Angeles, Cal.
Sept. 19	Phoenix, Ariz.
Sept. 20	El Paso, Texas
Sept. 21-22	Albuquerque, N. M.
Sept. 23	Pueblo, Colo.
Sept. 24-25	Colorado Spr'gs, Colo.
Sept. 26-27-28	Denver, Colo.
Sept. 29-30	Kansas City, Mo.

COMING EVENTS

PACIFIC COAST DIVISION, AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS

Annual Meeting—Vancouver, B. C.—August 8-11, 1922

PACIFIC COAST DIVISION, NATIONAL ELECTRICAL SUPPLY JOBBERS' ASSOCIATION

Quarterly Meeting—Del Monte—August 3-5, 1922

CALIFORNIA STATE ASSOCIATION OF ELECTRICAL CONTRACTORS AND DEALERS

Annual Convention—Santa Cruz—August 17-19, 1922

SOUTHERN IDAHO ASSOCIATION OF ELECTRICAL CONTRACTOR-DEALERS

Annual Convention—Hailey, Idaho—August 25-26, 1922

INVESTMENT BANKERS ASSOCIATION OF AMERICA

Annual Convention—Del Monte—October 7-11, 1922

Personals

H. L. Melvin, electrical engineer in the engineering department of the Washington Water Power Company, has been elected chairman of the Spokane section of the American Institute of Electrical Engineers for the coming year. Prior to coming to Spokane in 1920, Mr. Melvin was in the engineering department of the Utah Power and Light Company in Salt Lake City. He was graduated from Washington State

H. L. MELVIN

College in 1911 and immediately entered the testing department of the General Electric Company. He received a master's degree from the Massachusetts Institute of Technology in 1917. From 1912 to 1916 he was an instructor in electrical engineering in Washington State College. During the past year he has been secretary-treasurer of the Spokane section of the A. I. E. E.

Dr. J. W. Turrentine, formerly director of the experimental kelp-potash plant of the U. S. Department of Agriculture at Summerland, Cal., has obtained a furlough from the department for a period of six months to act as consulting chemist for the U. S. Kelp Products Corporation, the newly organized concern which has purchased the plant from the government.

Floyd Averill, general manager, Fobes Supply Company with headquarters at Portland, Oregon, is a recent San Francisco visitor.

Tracy E. Bibbins, president of the Pacific States Electric Company, is again in his San Francisco headquarters after having taken an active part in the sessions of the Northwest Electric Light and Power Association at Boise, during which he addressed the Rotarians and other citizens of Boise on the duty business men owe to their communities to see to it that pernicious legislation against the power industry be headed off whenever it may appear in the several commonwealths of the West.

W. S. Berry, San Francisco sales manager of the Western Electric Company, and **E. O. Shreve,** San Francisco manager of the General Electric Company, are again back at their Pacific Coast headquarters after a visit of several weeks in Eastern business centers.

John Greenawalt of the Mountain States Telephone and Telegraph Company, and **George W. Bixler** of the Denver Gas and Electric Light Company, attended the Associated Advertising Clubs convention in Milwaukee recently.

E. H. Waddington, western district line material manager of the Western Electric Company, Inc., is making his headquarters temporarily in Denver while his family is located for the summer in the nearby mountains.

John Rosseter, for many years president of the Sperry Flour Company, has resigned from that position to devote his time to his private interests. Mr. Rosseter has been a prominent figure in industrial and shipping circles on the Pacific Coast for many years. He was first connected with the firm of W. R. Grace and Company, later becoming Pacific Coast manager. He also became connected with the Pacific Mail Steamship Company as vice-president and general manager. During the war he served as director of operations for the United States Shipping Board.

G. O. Muhlfeld, director of engineering of Stone and Webster, Inc., returned from the Orient recently on the Steamer Siberia Maru. Mr. Muhlfeld was in the Orient on business, his company having charge of several hydroelectric installations in the Far East.

W. L. Morine, electrical engineer of Portland, is a recent San Francisco visitor.

J. W. Hackett, sales engineer for the Okonite Co., manufacturers of insulated wires and cable, is returning to New York after spending considerable time on the Pacific Coast opening a Western sales headquarters for the company. **S. Herbert Lanyon** has been appointed western manager for the company and will maintain offices as in the past in the New Call Bldg., San Francisco.

Alfred D. Flinn, secretary of the Engineering Foundation and Chairman of the Division of Engineering of the National Research Council, is now engaged in a several weeks' tour of the West, during which he will address gatherings of engineers in all of the principal cities of this district. Mr. Flinn goes as the emissary of organized research to enlist the aid of engineers of the far West in a nationwide plan of industrial research in which the Foundation, the Council, government departments and the industries will link their efforts. A big research highway program and the movement to drive the shipworm from American ports, in which it has caused billions of damage, are among the projects explained by Mr. Flinn, whose itinerary has already included Salt Lake City, Los Angeles, San Francisco, Sacramento, Riverside and Davis, California, and will extend to Portland, Seattle and Bellingham, Vancouver, B. C., Prince Rupert, Jasper Park, Alta and thence on East.

Frank D. Fagan, vice-president and general manager of the Edison Storage Battery Company, of Orange, New Jersey, has recently made an extensive business trip throughout the western territory. While in San Francisco, Mr. Fagan was the guest at a "welcome home" dinner, given him by his old associates and business friends in the electrical industry of that city.

A. E. Morphy secretary of the Southern California Edison Company, has resigned to become secretary-treasurer of the Pacific Gasoline Company. **Clifton Peters,** assistant secretary, was advanced to the position of secretary. Mr. Morphy has been with the Edison Company for fifteen years, entering its employ as a clerk in the auditor's office. When the United States went to war, he was one of the first to volunteer, retiring at the time of the armistice with the rank of Captain.

Mr. Wynn Meredith, California partner of Sanderson & Porter, who returned from an extended trip to New York early in June, has spent the past week examining the hydroelectric power projects of the Yosemite Power Company on the Tuolumne River.

Fenwick M. Thebo, president of the engineering firm of Thebo, Starr & Anderton, Inc., of San Francisco, engineers and constructors, has recently had conferred upon him the degree of Master of Arts by Union College at Schenectady, N. Y.

Markham Cheever, general superintendent and chief engineer of the Utah Power & Light Company of Salt Lake City, was a recent San Francisco visitor.

E. P. Markee, district manager of the Edison Lamp Works has left to attend the Sales Managers meeting of that company at Association Island, New York.

M. P. Maxwell, eastern sales manager of R. Thomas & Company, manufacturers of high tension porcelain insulators, is in Los Angeles working with their agents, the Western Electric Company.

A. R. Heywood, president of the Utah Public Utilities Commission, recently attended a conference of western public utility commissioners in San Francisco, called by the California Railroad Commission for the purpose of considering

A. R. HEYWOOD

the Supreme Court decision severing the Southern Pacific and Central Pacific Railroads. Mr. Heywood was a former mayor of Ogden and has long been associated with commercial and professional interests in the Intermountain district. He reports well of business conditions in Utah, which he says, are fast coming out of the period of business depression which followed the war.

K. E. Van Kuran, local district manager of the Westinghouse Electric & Manufacturing Company, has left for a two weeks' trip to the mining districts of Arizona and expects to cover the entire state .

Herbert S. Evans, dean of the engineering department of the University of Colorado, has been elected a member of the executive council of the Society for the Promotion of Engineering Education.

J. H. Cunningham, sales manager of the General Electric Company's Los Angeles office, has just returned from a trip to the General Electric factory at Schenectady, New York.

Frank van Gilluwe, lighting specialist of the Los Angeles office of the Western Electric Company, left recently for the Sunbeam Lamp Conference at Nela Park.

J. David Houser, whose article on personnel work appears on another page of this issue, is associated with three other university men in the enterprise which is known as the Bureau of Management Research. **Wilford E. Talbert** and **Frank A. Scofield** had been occupied with the direct problems of industrial and commercial organizations along the lines of personnel administration, Talbert as assistant director of the Bureau of Personnel Research at the Carnegie Institute of Technology and Scofield as a supervisor in corporation schools. **Charles C. Stech** and Mr. Houser had been engaged in personnel work in the service during the war, and the tremendously interesting experiment in classifying and placing men according to scientific methods had led them to believe that the same successful methods ought to be of great service in industrial personnel work. From the first there have been two aspects to the work. The first has been the public aspect—service to the community through spreading the gospel of better industrial relations. The second has

J. DAVID HOUSER

been the direct service aspect for individual organizations. The men who encouraged the work at the beginning felt that the industrial relations tone of a community was merely the sum total of the conditions in the separate industries, and that only as these conditions were improved through better personnel administration in individual industries would the entire situation be improved.

T. E. Holsey, formerly with the Washington Water Power Company, of Spokane, is now connected with the Los Angeles sales organization of the Western Electric Company.

William D'Arcy Ryan, head of the illumination Research Bureau of the General Electric Company, was a guest of the Denver electrical fraternity on his return to the East from Salt Lake City, where he completed arrangements for the installation of the lighting effects to be featured during the coming electrical exposition in that city in October.

M. H. Aylesworth, executive manager of the National Electric Light Association, and E. A. Phinney of the Jefferson County Power and Light Company and formerly president of the Rocky Mountain division of the N. E. L. A., spent the last week in June on a fishing expedition in North Park, Colo.

D. C. McClure, electrical superintendent of the Denver Gas and Electric Light Company, is making a tour of inspection of eastern central station properties.

Thomas F. Kennedy, for a number of years commercial manager for the Western Light and Power Company, has been transferred to the New York office of the Doherty Company to serve as assistant to George Williams, manager of the new business department. His place has been taken by E. B. Ball, who will make his headquarters at Boulder.

D. W. Proebstel, operating instruction engineer of the Portland Railway Light Power Company, and chairman-elect of the Portland Section of the American Institute of Electrical Engineers, is attending the annual convention of the Institute at Niagara Falls, Ontario, as the official delegate of the Portland Section.

F. R. Whittlesey, former secretary of the Oregon Association of Electrical Contractors and Dealers, and more recently field man for the Northwest Electrical Service League in Oregon, has left the services of the League and is now in the range sales division of the Portland Railway Light & Power Company.

A. S. Moody, Northwest manager, Supply Division of the General Electric Company at Portland, has left for a business trip to the East which will include a visit to the General Electric Company's factory at Schenectady.

O. B. Coldwell, vice-president of the Portland Railway, Light & Power Company, attended the National convention of the American Institute of Electrical Engineers, and is visiting the important business centers while in the East.

William Von Phul, president and general manager of the Market St. Ry. Co., has resigned to give his entire attention to Ford, Bacon & Davis, Inc., of which he is president and whose interest will require his continuous presence in New York. **Colonel C. N. Black**, vice-president of Ford, Bacon & Davis, Inc. has been appointed to succeed Mr. Von Phul as president and general manager of the Market St. Ry. Co. Mr. Black, who is well known in the electric railway industry, was president of the American Electric Railway Association in 1915 and was at that time vice-president and general manager of the San Francisco system, then called the United Railroads.

G. E. Armstrong, who has been the Pacific Coast Editor of the Electrical World for the past two years, has resigned to become the representative in Los Angeles of the Garland Affolter Engineering Company, manufacturers' agents. Mr. Armstrong was of the 1914 Class of the University of California and immediately upon leaving college he entered the employ of the Southern California Edison Company

G. E. ARMSTRONG

as assistant to the superintendent of generation. Later he was superintendent of transmission and then protection engineer and assistant to the chief electrical engineer. Mr. Armstrong is widely known through his technical writings and his activities in the technical and other electrical societies. He has served on numerous committees of the American Institute of Electrical Engineers and the Pacific Coast Electrical Association. For many years he has been a member of and secretary of the technical committee of this association. Upon leaving the Southern California Edison Company he was associate editor of the Journal of Electricity and Western Industry until he was given the position on the staff of the Electrical World.

Obituary

J. F. Blaschke, at one time with the Mazda Service Bureau at San Francisco and more recently editor of the Stimulator and in charge of the advertising of the Ivanhoe-Regent Works of the General Electric Company, died recently at his home in Cleveland.

Samuel Naphtaly, vice-president of the Great Western Power Company of San Francisco, and who has been associated with the electrical development of the West for many years, died recently in San Francisco following an illness of some months. Aside from his accomplishments in the electrical industry of the state, Mr. Naphtaly was widely known for his connection with the Oakland and Antioch Railway, of which he was the founder and first vice-president. He was also the organizer of the Los Angeles Shipbuilding and Drydock Company of San Pedro.

The Rome Wire Company, Rome, N. Y., has purchased all of the equipment and inventory of the **Toledo Enameled Wire Products Company** of Toledo, Ohio, and intends to install this equipment in its main plant as soon as possible. The purchase of this equipment by the Rome Wire Company will considerably increase the firm's production. The company reports that the volume of magnet wire business has considerably increased during the last few weeks and that motor business has also increased during May and June.

C. C. Callicott has opened the Callicott Electrical Company in the Jernigan Building at Clovis, New Mexico. The new store will handle a complete line of electrical appliances.

The Ackurate Rubber Company, Passaic, N. J., announces the appointment of the **Engineering and General Supply Company,** Los Angeles, as direct factory branch agents for California and Arizona, to handle the various lines of tape manufactured by it. The company also announces that district sales offices will be established throughout the West, the exact locations of which will be announced later.

The Rutenber Electric Company, Marion, Indiana, manufacturers of the "Marion" line of appliances, has placed on the market a new and efficient iron equipped with a "handle that fits the hand." The handle is a radically new idea both in construction and appearance.

The P. E. Chapman Electrical Works, St. Louis, Mo., has issued bulletin No. 101, describing the motor driven taping machine for taping armature and field coils. The machine embodies a number of new ideas including a slow speed motor, a cone clutch giving instantaneous and fine adjustments in speed, and an automatic brake.

The Ohio Brass Company, Mansfield, Ohio, has perfected two new arc weld bonds for electric railway service. The bond consists of steel terminals attached to twisted copper strand wire. The steel protects the copper from the heat of the arc and from molten welding metal.

The Roller-Smith Company, New York, manufacturers of electrical instruments, meters and circuit breakers, has recently issued Bulletin No. 820 describing its type "PV" ammeters and voltmeters and type "COD" indicators. The instruments were designed fundamentally for automotive vehicle use but are applicable for a wide range of other uses.

The Electric Furnace Construction Company, Philadelphia, Pa., has recently issued a bulletin describing the "Electro" steam generator. The bulletin cites a number of plants in which the steam generator has been installed and describes its various features. The company has also issued a bulletin describing the various types of electric furnaces for melting, refining and superheating iron and steel.

The Northern Equipment Company, Erie, Pa., has just issued a booklet, "Regulating Boiler Feed Water," which briefly and thoroughly covers the subject of boiler feed water regulation. A liberal use of charts and photographs has been made which aid in the graphic presentation of the subject.

The Colin B. Kennedy Company, San Francisco, has just issued Radio Bulletin C-3 describing the various types of radio equipment manufactured by that company. The book carries an attractive cover in colors and is well illustrated.

Manufacturer, Dealer, and Jobber Activities

The Pelton Water Wheel Company, San Francisco, has just issued a new 16-page illustrated booklet entitled "The Kern River Number Three Plant of the Southern California Edison Company," written by Ely C. Hutchinson, general manager of the company. The hydraulic prime-mover equipment for this plant is especially notable, since it comprises two 25,000-hp. Pelton vertical turbines operating under a head of 810 ft., the highest head reaction turbines in the world. Copies of the booklet may be obtained at either the San Francisco or New York offices of the company.

The Economy Fuse and Manufacturing Company, Chicago, announces the appointment of **Charles H. Bluske** as district sales manager of the Los Angeles office. Mr. Bluske was formerly connected with the Pacific States Electric Company and succeeds George L. Davis.

The F. W. Wakefield Brass Company, manufacturers of red spot lighting specialties, announces that plans are now under way for enlarging their factory at Vermilion, Ohio. The company reports that substantial increase in demand for both commercial lighting fixtures and automobile spotlights makes necessary the additional manufacturing facilities.

Ai's Illuminating Store is the newest electric store at Baker City, Oregon. F. A. Shultz and F. L. Robinson, both of La Grande, are the proprietors.

The Westinghouse Electric and Manufacturing Company has issued circular No. 4484 illustrating meter service switches. The switches are designed to meet every condition encountered by central stations in supplying service to homes and apartment houses and can be used in conjunction with standard makes of meters or independently.

The Intermountain Sales Company of Denver, of which E. L. Trowbridge is manager, has become a member of the Electrical Cooperative League in that city.

The George D. Roper Corporation of Rockford, Ill., has entered the electric appliance field with a radically different type of electric range which applies the principle of heat conductivity instead of radiant heat. The hot plate is made of a series of one-ampere units arranged in parallel with a maximum capacity of 25 amperes. Economy of operation and low maintenance cost due to the long-life heating elements are among the features claimed for the new product.

The Edison Storage Battery Company has recently issued a comprehensive booklet on storage batteries for gasoline truck lighting, in which it indicates that Edison equipment has a longer life of useful service than gasoline trucks themselves.

The Electric Heating Company of Tacoma recently received an order from the Indian Engineering Company of Bombay, India, for electric water heaters. The company, which is headed by W. D. Ludwick, has met with much success in the manufacture of electric water heaters and other heavy electric heating apparatus.

R. S. Willoughby, dean of Denver contractors, has taken over the Wesco Electric Supply Company, manufacturers' agents, carrying warehouse stocks in that city. O. P. Willoughby, his son, will be in charge.

The Hendrie and Bolthoff Mfg. and Supply Company, of Denver has made arrangements through W. B. Milliken of the Gillespie Eden Corporation to represent that company in the Rocky Mountain territory.

E. A. Daniels of the Isko Refrigerating Company with headquarters in Chicago, recently visited Denver and assisted O. S. More, representative in that city, in securing a number of commercial installations.

The Crooks-Nathan Household Appliance Company has been designated by the American Radiator Company as exclusive representative in Denver of the Arco Wand line of stationary and portable vacuum cleaners.

Whenever you see the picture of a man with a cigar in his mouth, you know it is either U. S. Grant, Barney Oldfield or Dave Harris of the Pacific States Electric Company, San Francisco. "Coats off" seems to be the distinguishing mark of A. E. Holloway, superintendent of the commercial department of the San Diego Consolidated Gas and Electric Co. Except for the fact that he is golfing and not fishing, we would presume that the "Doc" has just caught a grasshopper which he is holding in his right hand. Perhaps that explains the ticklish smile.

Business Outlook in Western Market Centers

Reflecting the Trend of Community Thought on Conditions and Events Affecting Business and Industrial Activities Throughout the West

Compiled and edited for the Journal of Electricity and Western Industry by correspondents in all principal Western cities.

SAN FRANCISCO

Although some slight echoes of the business depression through which the entire country has passed are still heard in the failure of occasional small manufacturers and importing concerns, whose extended credit was not sufficient to effect a permanent recovery, conditions on the whole are reported good. There is none of the customary lull in business which is usually a condition of the early summer season.

Sales of electric power reported by the power companies show an increase in the industrial use of electricity, a condition which is supported by a recent survey of the San Francisco district which shows 102 new factories in that city since the first of the year.

Building construction continues active. From the standpoint of real estate transactions, the period since the first of the year is reported as the most active in the history of San Francisco, property to the value of $70,581,377 having changed hands, in comparison to $39,045,472 during the corresponding period of 1921.

PORTLAND

Portland's records in building, banking, shipping and in the lumber industry established during the first six months of this year indicate a very healthy business and a gradual return to normal conditions. Value of building permits increased 53 per cent, bank clearings showed a healthy gain and the business of the port is the greatest since 1913. Production in the lumber industry has been from 5 to 15 per cent above normal for 6 to 8 weeks past, with new business equal to and in most cases exceeding production. Crop conditions throughout this section are good. Unemployment has long ceased to be a factor.

Conditions in the electrical industry are better than they have been for some time. Central stations are spending millions in extensions and improvements. Jobbers report business good and contractor-dealers are doing a fine business in wiring and fixtures as a re sult of the great building activity.

SEATTLE

Increasing activity in all industrial lines, slight advances in wages, and vastly improved employment situation throughout the state, are features of a recent business survey of the Puget Sound country.

Payrolls of Seattle and Northwest industrial plants are markedly larger at present, according to figures from the district supervisor of the State Department of labor. The greatest increase in employment is in the logging camps, shingle mills and sawmills, and in plants producing building materials.

Revival of fishing and mining industries throughout the district is gratifying. The demand for men for Alaskan canneries has been heavy and the shipments of materials and supplies to the far north far exceeds that of last year, to date.

The conditions in the lumber industry show continued improvement, with demand for lumber products very heavy. Wage increases have been announced in practically all of the large lumber sections.

Retailers and dealers report a very encouraging demand for electrical appliances during the month of June.

SPOKANE

A dry season is responsible both for a somewhat diminished winter wheat crop and damaging forest fires. In consequence, the sale of agricultural implements and allied departments of business is somewhat below normal. Spring wheat, however, is expected to redeem this situation and the outlook for the late summer and early fall is considered better than last year. Berries and small field crops show an increase over 1921 conditions.

Lumber mills are very active and in spite of extra shifts are reported unable to keep up with weekly orders. Unemployment is reported at the minimum.

Retail trade is slightly under that of last year in almost all fields, but improvement is shown over the previous month.

Building construction is active, building permits amounting to almost double the value for the corresponding period of 1921.

SALT LAKE CITY

Of immense importance to the industrial situation in the intermountain section is the announcement of the organization of the Columbia Steel company, a $15,000,000 corporation headed by California and Utah capitalists, to exploit the enormous iron deposits in Iron county, Utah, and some of the coal fields in Carbon county.

Industrial activity in this section is continuing to increase. Announcements of material reductions in the freight rates on ores mean another impetus to the rapidly increasing mining activities in this section.

The outlook for the sugar beet industry, both for the farmer and manufacturer, is brighter this year than for several seasons. Although the acreage is lighter, beets are in greater abundance and more healthy. General crop conditions are good.

Electrical dealers, jobbers and retail merchants in general report business improving.

Money is easier, and collections are better than for some time past.

Building activity continues at a healthy pace, and new construction is showing remarkable increases in volume, particularly in Salt Lake City, both over the previous month and the corresponding period of last year.

The unemployment situation is practically cleaned up. The large majority of unemployed men at present are those who are out because of strikes.

LOS ANGELES

There were 22,257 building permits issued in January 1st to June 30th inclusive for a total of $59,459,250 which represents an increase over the corresponding period of the year 1921 of approximately 75 per cent. For the month of June 1922, there was a total of 3751 permits issued for a total of $10,652,265, an increase over June 1921 of approximately 50 pe rcent. Bank clearings for the month of June were $433,837,978, showing an increase of approximately 25 per cent over 1922.

Agricultural and livestock conditions in the Pacific Southwest show continued improvement, with consequent increasing optimism on the part of the producers. Better growing conditions, comparatively steady markets and continuing ease of credit have been largely responsible for this condition.

The sale of electrical appliances during the month of June, both wholesale and retail, showed a material increase as a result of the June Bride Campaign.

DENVER

Conditions in this part of the country are somewhat unsettled, owing to the strike of the railroad shop mechanics.

Building operations in Denver during the first six months of the year were nearly doubled over the similar period in 1921. During June, permits to the amount of $1,815,700 were taken out, totaling for the first six months $9,232,000 as against the 1921 figure of $4,948,675, or an increase of $4,283,325.

Reports from the agricultural districts indicate improved crop conditions. Fewer failures in business have been recorded recently. Industrial conditions are fast reaching normal.

Optimism still pervades banking circles and is evidenced by increases in loans, both in number and amount, for financing new business.

Dollar values in wholesale trade are larger than last year, according to the Federal Reserve bank, but electrical merchandise is still moving slowly, along with dry goods and drugs.

Construction News and Industrial Developments

Suggesting to the Engineer, Contractor, Manufacturer, Dealer, Agent and All Business Men Opportunities for New Business

Bridges

Cal., Colusa—Contract for the motorization of the Colusa bridge over the Sacramento River has been awarded to Jenkins & Wells of Sacramento, whose bid was $13,825.

Colorado, Denver—The state highway department has awarded contracts for bridges, as follows: St. Charles river, east of Pueblo, $61,263; Sand Creek, near Brighton, $9,914; Breckenridge creek, north of Ordway, $3,261; Eleven timber bridges, Lincoln county, $37,737.

Ore., Salem—The State Highway Commission has awarded construction of a bridge over Elk creek at Drain, to Albert Anderson of Grants Pass at $13,527; bridges in Grant county near Dayville, to Lindstrom & Feigensen of Portland at $33,051.75.

Ore., Eugene—Eleven bridges have been marked for repairs or replacement on the Siuslaw road, according to J. W. McArthur, county bridge superintendent, who has returned from a trip to the coast. The bridges are all on the old military road, except one which will come on the Rainrock-Blachly highway.

Wash., Yakima—A steel bridge to replace the wooden structure across the Yakima river at Parker will be built this year by the O. W. R. & N. Co., the cost to be about $250,000.

Wash., Seattle—The Board of Public Works will receive bids August 4 for the erection of the superstructure of the Spokane Street bridge, estimated to cost $1,250,000. Bids provide for the construction of the double-leaf bascule span, 288 ft. center to center of trunnions, two approach spans each about 140 ft. long, and a steel girder span 136 ft. long. The bascule span will be 45 ft. wide. Involved in the construction are 3,760,000 pounds of structural steel, 351,000 lb. of machinery, and 8,570 yd. of concrete.

Wash., Seattle—The Reliable Iron & Wire Works 3028½ Western Ave., has been awarded the contract for the installation of crossing towers for the Spokane St. bridge across the west waterway at Riverside.

Buildings (Industrial)

Cal., San Francisco—The San Francisco News Co., is planning the erection of a two-story brick manufacturing building, at the southwest corner of Hawthorne and Howard Streets, to cost $75,000.

Cal., San Francisco—The Indiana-Pacific Motor Truck Co. will erect an assembling plant here, according to C. M. Menzies, western district manager.

Colorado, Denver — A four-story addition to the Merchants Biscuit Company will shortly be started at a cost of $113,000. The factory capacity will be doubled and the new machinery and equipment required will aggregate close to $75,000.

Ore., Portland—A permit has been issued to the Concrete Pipe Co., Board of Trade building, to erect a two-story factory, 120 x 114 ft. costing $20,000, at 162 Page street, between Albina avenue and Kirby street.

Ore., Portland—A building permit was issued to the Hauser Construction Co., to erect a 2-story factory, 81 x 351 ft. costing $80,000, at 1749 Albina avenue between the Columbia boulevard and the O. W. R. & N. right of way, for the Columbia Tire Corporation. Rasmussen, Grace Co., engineers, Chamber of Commerce building, prepared the plans.

Ore., LaGrande—The new one-story brick factory for the La Grande Construction Co. is expected to be completed within two weeks, according to C. E. Harris and H. P. Neilson, members of the firm, who have charge of the work. The new factory is being built on the site of the former buildings at the corner of Greenwood and Madison.

Wash., Seattle—The plant of the Seattle Suitcase Trunk and Bag Company will be doubled, according to A. J. Kotkins, president, who recently returned from a six weeks' trip east to purchase machinery.

Wash., Tacoma—The Roman Meal Company has announced plans for the construction of a manufacturing plant to cost $60,000, for the manufacture of Roman meal. Site has been selected and purchased.

Wash., Aberdeen—The Marine Equipment Company has purchased a large site between Aberdeen and Hoquiam, on which will be erected a new factory to cost $275,000. Construction will begin in August on the first buildings, which will be fireproof construction.

Wash., Spokane—The Potlatch Lumber Company is constructing a lumber manufacturing plant here to cost $100,000. Plant will be electrically equipped.

Wash., Bridgeport—Mr. and Mrs. R. L. Moorhead and J. J. Farrell are planning to erect a $250,000 plant in Pateros for cold storage and car icing. It would have a capacity for 1000 cars of fruit in addition to room for other perishable products.

Buildings—Miscellaneous

Ariz., Phoenix Armory—The contract for building an artillery armory at Mesa has been awarded to S. B. Shumway at $22,000. The building will be of brick and completion is specified at 90 days. Bids have also been received for the Phoenix State Armory but the contract has not yet been awarded.

Cal., Manteca—Packing House—The Central Pacific Railway has been granted permission to erect a packing shed on the right of way of the railway company northwest of Main street and south of the railroad tracks. The shed is to be 20 ft. in width and 200 ft. in length.

Cal., Los Angeles—Apartments—Russell and Alpaugh, architects, have completed plans for a four-story and basement Class C apartment house to be erected at the northeast corner of Seventh and Catalina streets for Mrs. O. I. Low and Arthur Bard. The cost of the structure is estimated at $250,000.

Cal., Stockton—Apartments and Stores—Contract for the erection of a three-story apartment and store building on the northwest corner of California and Lafayette streets, has been awarded to H. E. Vickroy on a bid of $54,000.

Cal., San Francisco—Memorial—L. P. Hobart recently won the competition for the best design for the Hawaiian $250,000 war memorial which is to take the form of a temple of music and a natatorium to be erected at Waikiki Beach, Hawaii, T. H. Bids for construction will be called for at an early date.

Cal., Long Beach—Salesroom—E. A. Green, Franklin dealer, will erect a $50,000 salesroom at 6th and American streets.

Colorado., Denver—Auto School—The Johnson Automotive Trades school is building a new home for what is said will be the largest automobile school west of Kansas City. It will include a modern automobile and machine shop and will cost in the neighborhood of $100,000.

Colorado, Denver — Restaurant — A two-story restaurant building to cost $150,000 will be built at 17th and Glenarm Street by Adolph Trachsel and Otto Hebestreit.

Colorado, Denver—Commissary—An addition to house the dining hall and kitchen at Regis College, to cost about $50,000 exclusive of equipment is planned.

Colorado, Denver—Garage—The Harrison Motor Company has completed plans for a $30,000 brick garage to be built close to the down town section.

Colorado, Denver—Hospital Additions—Additions to the Mercy and Osteopathic hospitals totaling $80,000 will be built immediately, according to the governing boards of those institutions.

Colorado, Denver—Shop—Nathan Bros., one of the oldest tailoring firms in this city, has purchased the old Rust mansion at 1528 Lincoln Street and will shortly remodel it at a cost of $40,000. According to Louis Nathan, innovations in lighting, heating and ventilating will be introduced, making it one of the best equipped institutions of its kind in the west.

Idaho, Caldwell—Theater—E. W. Waddell, of Nampa, Idaho, owner of the building bearing his name which houses the Liberty theater, intends to erect another theater here. The contemplated building is to be one story high and will cover a space 60 by 100 ft. An early start on the construction is promised.

Ore., Astoria — Hospital — Architect Hicks of this city has been selected to prepare plans and specifications for the new $200,000 Fraternal Hospital to be erected at Sixteenth and Franklin Ave. The property is 200 x 200 ft. in size and was recently purchased by the Fraternal Hospital Assn.

Ore., Portland—Church—A new church is being planned by the members of the Rose City Park Methodist Episcopal church, the cost of which will be about $50,000.

Ore., Portland—School—Work will start the latter part of July on a new $50,000 building to be erected for St. Peter's Parish in Lents, at the corner of 87th Street and Foster Road.

Ore., Portland—Store—Claussen & Claussen, architects, are preparing plans for a 50 x 100 ft., 8-story store and specialty shops for I. Holsman. The building will be erected at Third and Alder Streets. It will be of reinforced concrete and will cost about $175,000.

Ore., Portland—Club—Work has been started on the new $200,000 Oddfellow's temple to be erected at Tenth and Salmon Streets.

Ore., Portland — Commercial — A permit has been issued to A. C. Myers, to erect a two-story building at 361 Hawthorne Ave., between East 3rd and Grand Avenue, for Howard Cooper & Company, 250 East Water Street. It will be 95 x 100 ft., costing about $30,000.

Ore., Roseburg—Apartments—Work has started on the Kohlhagan apartment house, being

constructed by George Kohlhagan, a local merchaint. This structure, which is to be built of reinforced concrete, will be Roseburg's first large apartment building and is to cost approximately $125,000.

Wash., Chehalis.—Church—Plans for the construction of a new St. Johns church, parish house and school, to be located on Cascade avenue, between 6th and 7th streets, are being prepared by Hill, Mock & Griffin, Chehalis and Tacoma architects, and it is planned to begin the buildings under contract this summer. It is expected that the buildings will cost $40,000.

Wash., Seattle—Apartments—Contract for the L. C. Trouthon apartment house, to cost $225,000 has been awarded to the The Pacific States Construction Company, Seattle. Structure will be six stories high containing 63 two-room and 33 three-room apartments. Electric equipment including ranges and heating devices will be installed throughout.

Wash., Yakima—Apartments—Mrs. L. W. Besancon has had plans prepared for an apartment house at West Yakima and 9th Avenue, to cost $75,000. Work will proceed immediately. Electric ranges will be installed.

Wash., Seattle—Office—The Dexter Horton Estate has announced that construction will proceed immediately on proposed $2,500,000 bank and office building to be erected at 3d Avenue and Cherry Street. Structure will be 12 stories high, and will be built in two units. First unit will be 127 x 120 feet containing 500 offices; second unit to be started as soon as first is completed, will be 14 stories high, containing 500 offices. Building will be of reinforced concrete and steel. John Graham, L. C. Smith Building, architect.

Wash., Spokane—School—Jasper & McClellan, here, on a bid of $79,970, received the contract for erection of a new high school building at Sandpoint, Idaho. Structure complete will cost $150,000.

Wash., Tacoma—Hotel—The Citizens Hotel corporation had been formed to handle the construction and financing of the proposed new $1,500,000 community hotel to be erected in this city. Temporary acting board is composed of Henry A. Rhodes, Major Everett G. Griggs and J. T. S. Lyle. More than a million dollars has been pledged, which insures the immediate commencement of work on the project.

Wash., Seattle—School—A new $100,000 school for St. Alphonsus' Parish on Fifty-eighth St., between Fourteenth and Fifteenth Avenues, will be built shortly. The building was planned by Architects Lundberg and Mahon, and general contractor is Charles H. Schaar. The structure, according to plans, will be three stories in height, 58 x 199 ft., covering an entire block.

Wash., Seattle—Fraternity House—Work was started last week on the construction of a new $45,000 home for the Delta Chi Fraternity of the University of Washington at the southwest corner of East Forty-seventh Street and Nineteenth Avenue Northeast. The building will be of old English Tudor design and will contain about thirty rooms. It is of brick and hollow tile construction. Architects are C. H. Bebb and Carl F. Gould.

Wash., Seattle—Hotel—Articles of incorporation for the Community Hotel Corporation of Seattle, organized for the purpose of building a hotel, have been filed and a lease for the block on the University tract to be used as a hotel site has been signed. The tract is to be cleared of all present buildings and turned over to the hotel company within four months. The company agrees to erect a hotel on the site within 18 months after receiving possession of the lot, at a cost which shall be not less than $2,000,000.

Wash., Kelso—Mill—The Long-Bell Lumber Company is preparing for construction of its mammoth mill and logging operations at Kelso. A dock 500 ft. long and 48 ft. in width is under construction adjacent to the mill site. A ferry will be operated between the dock and Rainier, where a landing also has been secured for transfer of equipment and machinery for the plant. This dock will be completed soon and put into use.

Wash., Spokane—Mill—The Diamond Match Company is erecting a new planing mill at Cusick to cost $30,000, at which lumber not suitable for match wood will be prepared for market. The match plant of the company in Spokane is also being enlarged and improved throughout.

Wash., Tacoma—Mill—The plant of the Mineral Lake Lumber Company, destroyed by fire with a loss of $250,000, will be rebuilt, according to Albert Cookingham, treasurer of the company.

Dams

Ariz., Prescott—S. D. Gillis Engineering Company has been awarded contract for building the Banning Creek Dam, price $79,434.

Ore., Bend—Work on the Crane Prairie storage reservoir dam, the beginning of a $500,000 irrigation program outlined by the North Canal Company, is to start at once. The dam will be completed by October 1, according to John Dubuis, engineer for the company.

Ore., Coquille—A $40,000 dam to be used for storing a supply of water for the city of Coquille, is to be built on Rink creek, a tributary of the Coquille river. Stevens & Koon, engineers, are in charge.

Highways

Cal., Yreka—The construction of a 65-mile road down the Klamath river from the mouth of the Shast river to Happy Camp is under way. The work is beingd one by convict labor and is under the supervision of N. F. Taylor, engineer of the State Highway Department.

Colo., Durango—Approximately $50,000 will be spent in rebuilding the Durango-Silverton-Ouray highway between Durango and Silverton during the remainder of the present year. The federal government has appropriated $35,000 for the work, the state highway commission an additional $5,000, and other appropriations will reach a total of $50,000 for this year's improvements.

Idaho, Kamiah—A $50,000 bond issue will be voted for the construction of a highway from Kamiah to Nez Perce. This bond issue makes possible the connecting link between the North and South highway and the Lewis & Clark highway. With this $50,000 issue, $35,000 of state money and $20,000 county money will be put on the road, making a total of $105,000.

Ore., Salem—The State Highway Commission has made the following disposition of various projects: Unit No. 1, Myrtle Point-Camas Valley section of the Coos Bay-Roseburg highway, Coos County, 11.62 miles, rock or gravel surfacing; awarded to Warren Construction Co., at $61,000; the Merrill section of The Dalles-California highway in Klamath county, 2.58 miles of grading and surfacing; to Klamath County Court at $31,863; the Neskowin-Hebo section of the Coast Highway in Tillamook county, 12.66 miles of grading and surfacing, to the Tillamook County Court at $157,383.50.

Wash., Chehalis—George E. Banderet, here, on his bid of $34,899.90 received the contract from Lewis county for clearing, grubbing and draining 4 miles of the National Park Highway, in Lewis County.

Wash., Seattle—Contract for paving the Orillia-Kent road,a long the west side of White River Valley, has been awarded by King County to Albertson, Cornell Bros. & Walsh of Tacoma, for $138,500. Contract provides for a concrete road, 20 feet wide and 4.38 miles long. Engineer T. R. Beeman's estimate for the work was $143,731.97.

Irrigation Projects

Idaho, Boise—The state reclamation district bond commission has issued an order recommending the certification of $500,000 worth of irrigation bonds of the Crane creek and Sunnyside irrigation districts in Washington county, Idaho. The Crane creek district proposes to issue $165,000 worth, and the remaining $335,000 worth of bonds will be issued by the Sunnyside district. The Crane creek district comprises 3,591 acres of irrigated land and the engineer's report to the commission places the reasonable value of the lands in the district at $408,425. The Sunnyside district includes 6,514 acres of land and the reported value is $873,437.

Montana, Great Falls—The low bidder for the construction of canals and structures on part two of the Greenfield division of the Sun river project which will provide laterals sufficient to place 12,000 additional acres under irrigation is Fred Cooledge of Laramie, Wyo. The reclamation service expects to call for bids for the construction of a concrete bridge at a point where the Greenfield south canal crosses a state highway. It will be 42-ft. span with a width of 18 ft. Designs of the bridge have been completed and will be submitted to the state highway commission for approval.

Ore., Salem—Plans for the reclamation of the Eagle Point irrigation district, in Jackson county, were presented and a request for a certification of its $400,000 bond issue made by a delegation from the district recently at the office of Percy Cupper, state engineer. Contracts for construction work probably will be let in July. The district, which covers 5,000 acres, expects to secure its water supply through the construction of a canal from Big Butte creek.

Wash., Ellensburg—Report of John R. Sherman, engineer of the Kittitas Reclamation District, has been made public, outlining the revised plans for the construction of the proposed Kittitas high line canal, a project which was first surveyed in 1889. The canal now proposed will be 91.32 miles long, of which 26.2 miles will be concrete lined. According to the estimate, 33 acre-inches of water would be distributed, approximately 10 per cent more than provided for in prior plans. The estimated cost of the project, which will irrigate 70,000 acres in Kittitas County, exclusive of storage water, would be $6,691,423, an average of $99.04 an acre. The district has a contract with the federal government for water with easy payments, covering 20 years, after the water is on the land.

Wash., Prosser—By a vote of 221 to 5, residents of the Horse Heaven irrigation district formally ratified recently a $32,000,000 bond issue and contracts for the construction of the proposed project. The conttracts call for a 112-mile canal, 96 miles concrete-lined, eight miles of tunnel and nine miles of siphons. The work is to be started within 60 days. Of the 340,000 acres in the project, 256,400 acres will be watered by the first unit.

Power Projects

B. C., Victoria—The East Kootenay Power Company, which supplies the towns of Fernie and Cranbrook, B. C., with electric light and power from the plant that it has developed on the Bull river, will commence at once on the development of a 20,000-h. p. plant on the Elk river. The construction of the latter plant has been made necessary because the company has entered into a contract to supply the Consolidated Mining & Smelting Company with power to operate all the machinery at its Sullivan mine and the new concentrating plant which is in course of construction and which will have a capacity of 1,500 tons of ore daily. At the present time the Sullivan mine is provid-

ing more than 80 per cent of the lead and 90 per cent of the zinc outputs of Canada. The contract calls for the delivery of not less than 8,000 h. p.

Cal., Turlock—By an overwhelming vote the proposition to distribute power from the Don Pedro plant by the two districts of Turlock and Modesto was recently carried. The voters also took favorable action on the plan to issue bonds in the sum of $4,000,000 to erect a power house, pole lines and transformer stations.

Cal., San Francisco—Bids for supplying $135,000 worth of electrical equipment for the Moccasin Creek power plant on the Hetch Hetchy water project of the city were called for yesterday by the Board of Public Works. The bids will be opened August 9. Transformers and accessories of an estimated cost of $75,000 and switchboards and accessories valued at $60,000 are included in the bids to be received. The equipment will be placed in the power house at Moccasin Creek, 140 miles from this city, which, when completed, will produce annual power equal to the present total electric supply of San Francisco.

Colo., Loveland—Bonds in the amount of $425,000 will be issued to build a municipal hydro-electric light and power plant on the Big Thompson river. The city council has authorized the mayor to receive bids.

Idaho, Twin Falls—Construction of an electric transmission line from the terminal of the Idaho Power Company's line east of Hansen to Murtaugh will be completed by A. Harvey Ball of Burley, under provisions of an agreement with the Murtaugh Mutual Electric company, which was formed several months ago to carry out the enterprise, and which, after purchasing considerable material, suspended operations because of the financial situation. Under the agreement, which was filed in the office of the county recorder, Ball will receive, for completing the undertaking, all of the material purchased by the company, and sole ownership of the line after its completion.

Ore., Klamath Falls—Sale of $123,000 worth of street-improvement bonds was authorized by the city council. Paving will start as soon as the bonds are sold. A new sewer unit will be installed at once at a cost of $60,000. The contract was let to G. C. Lorenz, local contractor.

Ore., Hood River—Construction work has begun on the new $1,250,000 power plant of the Pacific Power & Light company here. The Phoenix Utility Company will have charge of the work, H. H. Schoolfield of Portland being general engineer.

Wash., Hoquiam—Work has started on the foundation for the $250,000 power plant which the Grays Harbor Railway and Light Company is to install at the Grays Harbor mill. The new plant, it is expected will double the power supply of the Harbor and will enable the power company to furnish light and power to Montesano, Elma and other eastern county cities.

Railways

B. C., Vancouver—With a view to supplying the increased demand for electric power in Vancouver and the surrounding district, the B. C. Electric Railway Company will drive a tunnel to connect Lillooet and Stave lakes, and thus greatly increase the water supply in the latter lake. The tunnel, which will be rather more than 4,000 ft. long and 16 ft. in diameter, will be driven through rock for practically the entire distance, and it is to be lined throughout with concrete. If the present plans are carried out the work will be commenced from both ends this summer, and, it is expected, will be completed by September, 1923. It is estimated that the cost will be in the neighborhood of a million dollars.

D. C., Washington—A certificate authorizing the Los Angeles and Salt Lake Railroad to construct a new line from Delta to Fillmore, Utah, a distance of 31.4 miles, was issued today by the Interstate Commerce Commission. It is estimated that the line will cost $701,188, and that with the construction of 3.6 miles of secondary tracks it will make accessible about 90,000 acres of farm land and about 100 square miles of white pine timebr. The Union Pacific and Oregon Short Line have agreed to advance the funds for the work and the commission certificate held that it was probable the line would pay expenses as a feeder to the larger systems.

Streets and Sewers

Utah, Ogden—The Wheelwright Construction Company of Ogden has been awarded the contract for paving of upper Twenty-fifth street district, consisting of three blocks on Twenty-fifth street and on Tyler avenue from Twenty-fifth to Twenty-sixth streets. The amount of their bid was $47,288.86.

Utah, Provo.—The contract for the curb and gutter on Third West street has been let by the city commission to Christensen, Jacobs & Gardner for $12,185.90. Work will begin immediately.

Utah, Ogden—The Taylor-Child Construction Company has been awarded the contract for paving in the West Ogden district. The contract calls for a five-inch concrete base and two-inch bitulithic top. The bid was $55,051.

Wash., Seattle—J. B. Covello, on his bid of $73,316.50, received the contract for grading and paving Corson Avenue.

Wash., Seattle—John Mattson, contractor, on a bid of $273,217.25 submitted the low bid for the grading of Marginal Way, Seattle. Three other bids were submitted. City Engineer A. H. Dimock's estimate for the work was $272,390.80.

Wash., Aberdeen—The Green Engineering Company, here, on a bid of $25,536, received the contract for paving of Michigan street, from Heron to Simpson Avenue.

Wash., Seattle—The Board of Public Works recently awarded to Scalzo & Company, 1708 22nd Avenue South, contract for a concrete and brick sewer in Murray Avenue, et al, on their bid of $227,845.

Waterworks

Cal., Lakeport—A report has been filed by City Engineer John Sullivan regarding a water and sewer system here. It will be necessary to hold an election for a bond issue to spend $55,000 for water system, $10,000 for the outfall sewer system, for which three septic tanks will be constructed. The estimates include a 2,000 gal. storage tank, fire hydrants, pressure valves and cast iron pipe for water extensions. By establishing an automatic switch at the pump and reservoir the system will supply 1,000,000 gal, per day.

Cal., Napa—The city council has taken another step toward acquiring a municipal water system for Napa by passing a resolution deciding to call an election for bonding the city for that purpose. It is estimated that the project will cost $600,000—$240,000 to purchase the Napa City Water Company's plant and $360,000 to bring the water from Milliken Canyon into Napa.

Cal., Los Angeles—Water bond issue for $250,000 for improvement of San Gabriel Valley water system carried at election recently held. Work of improving valley water system will begin at once.

Colo., Fort Collins—The construction of a settling basin with a capacity of 2,000,000 gallons for the municipal water works system has been authorized by the city council. Bids are being received by John Revell, city engineer.

Nev., Elko—In an endeavor to augment the flow of water for the municipal plant of the city of Elko, drilling operations have been commenced on the China ranch, taken over by the city when it became the owner of the present municipal system. Water filings have been made for an underground flow of 2,00,000 gal., and it is this water that it is hoped to develop in sufficient quantity for augmenting the present supply and for reserve in the future. A contract has been entered into between the city and Charles Reinken for the drilling of eight wells.

Utah, Ogden—Thirty-four blocks of water main extensions have been authorized by the city commission. The improvement will cost about $150,000, according to the estimate of city engineer W. E. Craven, who has been instructed to publish a notice to contractors for the work. Bids will be opened August 1.

Wash., Walla Walla—The contract with the Puget Sound Bridge & Dredging Company of Seattle, for the completion of water works improvements at a cost not to exceed $132,715, has been signed by Mayor Hill. Work will start immediately.

Wash., Walla Walla—Bids submitted on June 27 for the contract to complete Division No. 2 of the Walla Walla waterworks development show a decided decrease over those submitted on June 6 and rejected by the city commission. Low bid on the latest call was that of Puget Sound Bridge and Dredging Company, Seattle, who were low on both wood stave and steel pipe; their bid was $110,847.75 for wood pipe; $142,532.40 for steel pipe. The Walla Walla Concrete Pipe Company, Walla Walla, bid $139,256 for wood stave pipe. The city water commission has taken the bids under advisement. The job involves the building of a new diversion dam and intake on Mill Creek, and furnishing 4 miles of 20 in. conduit; construction of wagon road and telephone line, including the furnishing of all materials.

Miscellaneous

B. C., Esquimalt—Drydock—The Dominion Government has ordered thec ontinuance of work on the drydock at Esquimalt, B. C., and has appropriated $1,000,000 to carry on the work during the present fiscal year. The construction of the drydock was ordered by the late government and more than a million dollars had been expended in excavation work when the work was suspended, following a change of government. The suspension of operations, however, raised such a protest from the citizens of Victoria and Esquimalt that it was thought wise to order the continuance of the work. It will take two years before the dock will be finished; the total cost is estimated at five million dollors.

B. C., Vancouver—Piers—The Canadian Pacific Railway Company is asking for tenders for the construction of a new pier between piers A and D on Vancouver harbor, at the Pacific terminus of the railway. Plans and specifications may be seen at the office of H. Rindal, Vancouver. chief engineer for the company. Tenders will be received up to three o'clock, p. m., on Monday, July 17. The contract will call for the work to be completed by Sept. 30, 1923. The pier will be 850 ft. long and 330 ft. wide, and it is estimated that the cost will be in the neighborhood of two million dollars.

Cal., Colusa—Packing Plant—The contract for the construction of the plant of the California Prune and Apricot Growers' Association at Colusa was awarded to A. Webster of Chico. The contract calls for an initial expenditure of over $80,000 and the work will start immediately.

Colo., Denver—Lighting Plant—The Central Gas and Electric Company, through F. L. Cox, has secured the contract for the electric lighting plant, wiring, etc., for the new school building at Meeteetse.